

THE IRON AGE

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 79: No. 19.

New York, Thursday, May 9, 1907

\$5.00 a Year, including Postage.
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Reading Matter Contents.....page	1451
Alphabetical Index to Advertisers "	195
Classified List of Advertisers "	186
Advertising and Subscription Rates "	194

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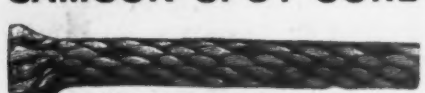
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Ad. on Page 16.

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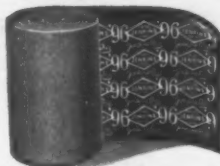
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49 CLIFF ST., NEW YORK.

THE IRON AGE

New York, Thursday, May 9, 1907.

Motor Drive for Lathes.

Several Interesting Applications Designed by the Lodge & Shipley Company.

Lathes being the most commonly used tools, the introduction of individual motor drive in any machine shop will involve equipping one or more lathes. Although a lathe is in many respects the simplest machine tool to which a motor can be applied, there are many ways of

stock to economize floor space. A contention directly opposed to this is that the motor should be mounted on an extension at the head end, the argument being that accessibility, convenience in arranging the transmission, protection of the motor and appearance are all so greatly improved as to offset the somewhat greater floor space required. This is the stand taken by the Lodge & Shipley Company, Cincinnati, Ohio, and in the designs herewith illustrated this feature is one of the most pronounced. For large lathes, such as are illustrated in Figs. 1, 2 and 4, it is common to mount the motor in this

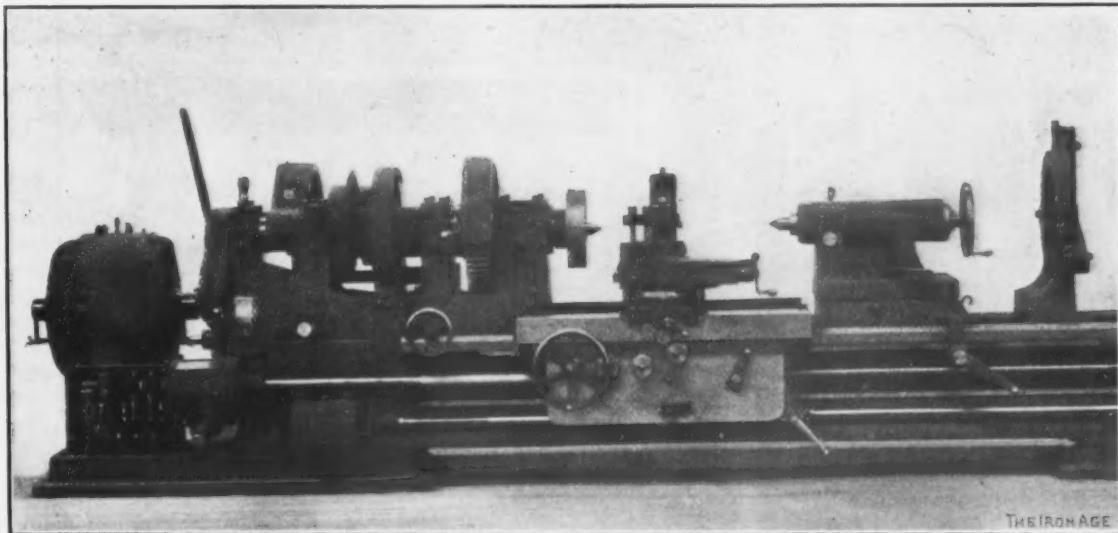


Fig. 1.—A 36-In. Standard Patent Head Lodge & Shipley Lathe with 10 Hp. Triumph Motor.

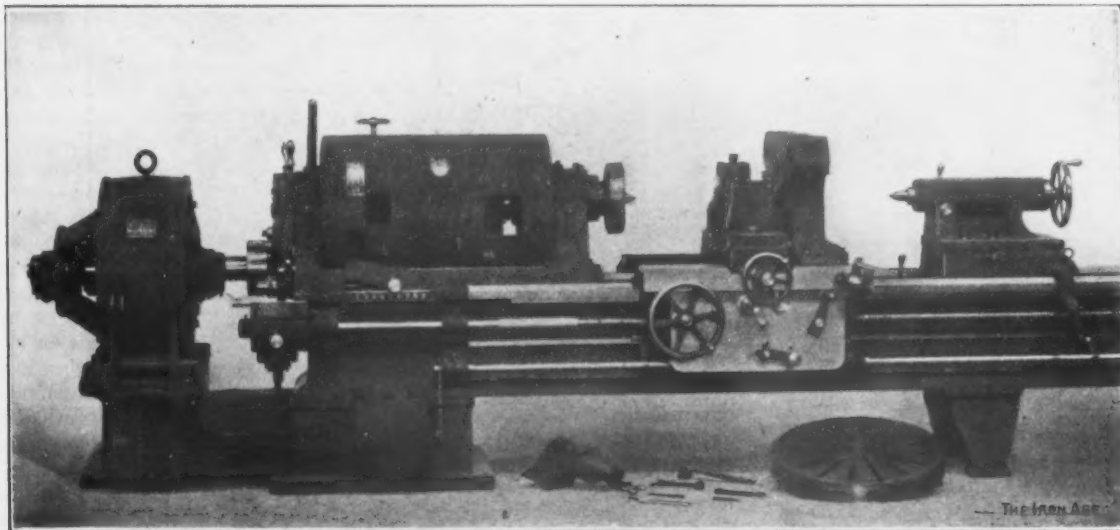


Fig. 2.—A 27-In. Patent Head Lodge & Shipley Lathe with a 10-Hp. Westinghouse Motor.

doing it, and designers have shown a tendency to take sides on the fundamental principles. For example, there are those who advocate constant speed motors, with all of the changes of speed obtained mechanically, while others favor the control of speeds electrically through variable speed motors, and between the two extremes there is a larger class that prefers to combine the two ideas. There are adherents to each of the three ways of connecting the motor to the lathe—by gear, chain or belt—with a few who compromise by using gears and chain or belt in combination. Another mooted point is the location of the motor, the apparently predominating leaning being toward placing the motor over the head-

way, because its size and weight are obstacles to the placing of the motor over the headstock; but on smaller lathes, such as the one shown in Fig. 3, it is more unusual to mount the motor at the end.

Fig. 1 shows a 36-in. Lodge & Shipley patent head lathe with a 14-ft. bed, driven by a 10-hp. Triumph motor with 2 to 1 variable speed range, giving 450 to 900 rev. per min. of the motor. The controller, mounted on the head end of the lathe and manipulated from the carriage, is a full reverse drum type of controller with resistance, made by the Cutler-Hammer Mfg. Company, Milwaukee. Six mechanical speed changes are obtained through gears in the headstock, and 20 electrical changes

for each mechanical change, making 120 speeds in all, ranging from 5.2 to 311 rev. per min. of the lathe spindle. The feeds, 40 in number, range from $2\frac{1}{2}$ to 70 per inch, and the threads which may be cut, from $\frac{1}{2}$ to 14 per inch. Some idea of the size of the lathe may be had from its more important dimensions. It swings 37 in. over the bed and $24\frac{1}{4}$ in. over the compound rest. The greatest distance between the centers is 7 ft. Without the motor the machine weighs 14,500 lb.

per min. The lathe swings $27\frac{1}{2}$ in. over the shears, $17\frac{3}{4}$ in. over the compound rest and takes $11\frac{1}{2}$ ft. between the centers. The net weight of the machine alone is 10,500 lb. The lathe has 32 feeds, ranging from 5 to 80 to the inch, and is capable of cutting 32 threads from 1 to 16 to the inch.

Fig. 3, which is a view of a 14 in. x 5 ft. toolroom lathe, driven by a $2\frac{1}{2}$ -hp. Triumph motor, is more radical in its driving arrangement for the reason, as before

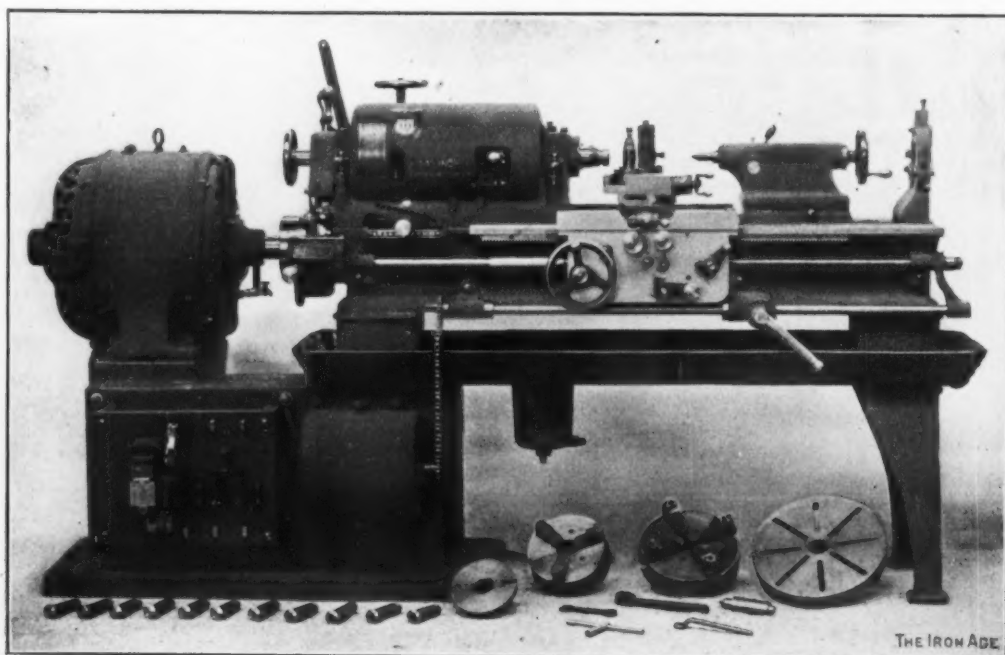


Fig. 3.—A 14-In. Lodge & Shipley Toolroom Lathe with $2\frac{1}{2}$ -Hp. Triumph Motor.

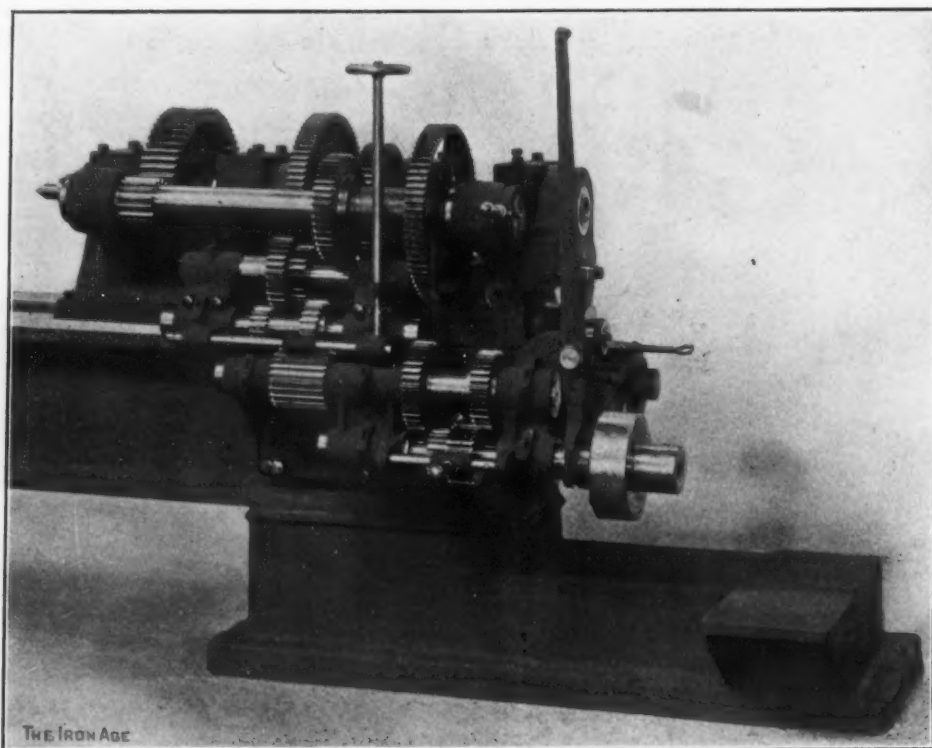


Fig. 4.—A Rear View of a Special Geared Head Lathe Adapted for Constant Speed Motor Drive.

A 27 in. by 18 ft. patent head lathe, driven by a 10-hp. Westinghouse motor, is shown in Fig. 2. The motor is of variable speed type, 2 to 1 ratio, running at 450 to 900 rev. per min. The same type of controller as referred to in connection with Fig. 1 is applied, but the location of the controller handle is slightly different, as will be noticed. The patent head affords six mechanical speed changes, and the motor 20 electrical changes for each mechanical change, giving in this case also 120 spindle speeds, the range, however, being from 6 to 334 rev.

stated, that lathes of its size generally have the motor mounted over the headstock. The electrical equipment of the machine includes a Cutler-Hammer controller and resistance and a General Electric circuit breaker. The motor operates at from 500 to 1000 rev. per min., 20 speeds being obtained through the controller for each of the six mechanical changes afforded in the headstock, making 120 spindle speeds in all. Of itself this lathe is interesting because of its equipment, which includes a taper attachment, draw-in chuck, one 9-in. four-jaw com-

bination chuck and one 8-in. three-jaw independent chuck. All of these parts with wrenches, &c., are shown either in the lathe or on the floor. The lathe swings $14\frac{1}{8}$ in. over the bed and 9 in. over the compound rest, and takes between centers $1\frac{1}{2}$ ft. The machine weighs 2100 lb. net, and is capable of 50 feeds from 16 to 512 per inch, and 50 thread cutting feeds ranging from 2 to 64 to the inch. When desired the machine is fitted with metric lead screw, and other options are belt drive, an English tool post or a European tool block.

The mechanical part in the drive of a 24-in. lathe ready to receive a motor on the extended base, as seen from the rear, is shown in Fig. 4. This equipment is intended to be driven from a constant speed motor running at 850 rev. per min., and all of the speed variations are obtained mechanically through the gears. There are two sets of slip gears with double back gear changes, giving a range of 12 spindle speeds varying from 6.7 to 191 per minute. The slip sleeve is controlled by a pilot wheel operated from the front of the lathe. While in the illustration the gearing is exposed, it is all incased when the tool is in operation. The gears are cut with individual cutters; the shafts are tool steel, and the bearings are equipped with ring oilers.

Judging from the machines shown, it would be fair to say that the Lodge & Shipley Company, in addition to being distinctive by advocating that the motor be placed at the end instead of above the headstock, is of that class as referred to in the first paragraph, which believes in a combination of mechanical and electrical means for varying speeds with an inclination to favor mechanical changes if it comes to a decision between the two. The patent headstock, which is a feature of this company's lathes, lends itself with peculiar adaptability to electric drive.

An Improved Rockford Shaper.

The tool illustrated, built by the Rockford Machine Tool Company, Rockford, Ill., is an improved 12-in. crank shaper, with quick return stroke, made from new designs and patterns. To make it capable of rapid and accurate work using high speed steel tools, it has been proportioned to withstand exceptionally heavy cuts.

The base is of pan construction, for catching oil, chips, dirt, &c., and has a forward extension machined for the table support. The column is heavy, strongly reinforced, and has an opening under the ram for key-seating shafting up to $2\frac{1}{2}$ in. diameter. The cross rail is deep, well braced, strongly clamped and gibbed to the column, and has $7\frac{3}{4}$ -in. front and $1\frac{1}{4}$ -in. top bearing surfaces for the apron. Both the cross feed and elevating screws are provided with adjustable graduated collars reading to 0.001 in., the latter being also provided with ball thrust bearing and power feed.

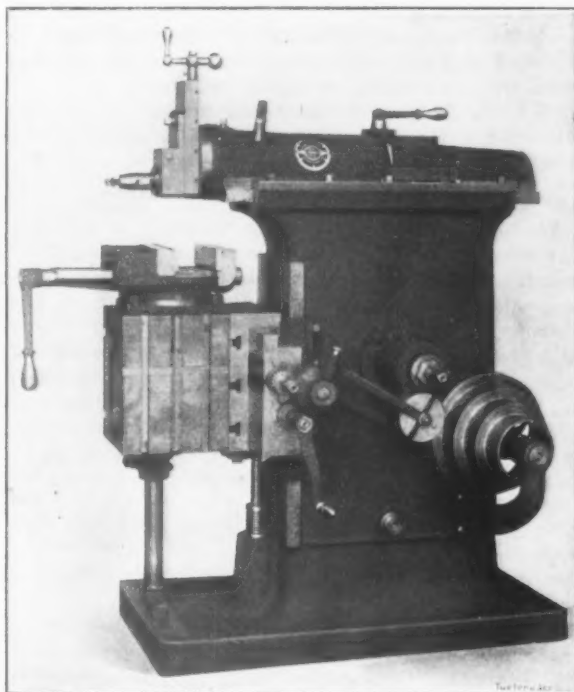
The apron has a very wide front and top bearing accurately fitted, gibbed and clamped to the rail, and is provided with three T-slots. It has a full length taper gib, adjustable endwise by a double locking screw and adjustable clamp plate below. The table is of box form, T-slotted on both the sides and top, with a V on the side for holding shafts and similar work vertically. The table can be readily detached and work be strapped to the apron. A table support, as shown, is furnished when required. The vise has steel faced jaws and swivels on a graduated base, which can be attached to the top or either side of the table. The improved screw arrangement is such that the jaws are drawn and not pushed together, the thrust being taken by a steel collar nut, which relieves the frame of strain tending to spring it or impair its accuracy.

The ram is heavily ribbed, is $31\frac{1}{4}$ in. long and has a screw adjustment for length of stroke. The position can be changed without leaving the work, and with the tool in motion or at rest. The head is graduated, swivels to any position, and clamps by an improved locking device, which draws it squarely against the face of the ram without shifting it while being locked. The rocker arm is strong and heavy, with provision for adjustment to

compensate for wear of the crank shoe. It has quick return and an index to show the length of stroke.

The four-step cone is supported between the column and an outboard bearing, and drives through gearing giving a ratio of 6 to 1, with a range of strokes from 15 to 65 per minute.

The cross feed is automatic in either direction. The feed connecting rod adjusts itself to any height of rail and has positive drive, easily regulated to any degree of feed. The vertical feed is also positive, being driven by the same means. Ball bearings are provided for the elevating screw, which is actuated through steel bevel gears protected from chips and dirt, thus reducing fric-



The 12-In. Single Geared Crank Shaper Built by the Rockford Machine Tool Company, Rockford, Ill.

tion. It is of the telescopic pattern, never recedes below the floor and is out of the way of falling chips.

The following are the principal dimensions:

Actual length of stroke, inches.....	14
Horizontal travel of table, inches.....	16
Vertical travel of table, inches.....	15
Greatest distance from ram to table, inches.....	17
Feed to head, inches.....	6
Top of table, inches.....	10 x $13\frac{1}{2}$
Side of table, inches.....	$9\frac{1}{2}$ x 12
Ram bearing in column, inches.....	$8\frac{1}{2}$ x $24\frac{1}{2}$
Vise jaws, inches.....	2 x 9
Vise opening, inches.....	10
Weight of machine and countershaft, pounds.....	1,500

The shafting is of high carbon steel, finished by grinding. The bearings are long and are bushed, providing for the maintenance of original centers. All shaft bearings are self oiling and have covered oil holes conveniently placed. The bevel gears, vise jaws and gibs are of steel. All gears and T-slots are cut from solid stock and in all particulars the construction is claimed to be consistent with the purpose of producing an unusually powerful tool for its size.

The Pennsylvania Railroad Company has placed orders for 200 steel passenger cars, 90 to be built by the American Car & Foundry Company, 85 by the Pressed Steel Car Company, and 25 in the railroad shops at Altoona. The proposed tunnel equipment will comprise 1000 passenger cars, all to be of steel.

The Whiting Foundry Equipment Company, Harvey (Chicago suburb), Ill., manufacturer of cranes and foundry equipment, announces the appointment of a new Southern representative, H. W. Canning, with headquarters in the Brown-Marx Building, Birmingham, Ala.

The German-American Tariff Convention.

Details as to Manufactures of Metals.

WASHINGTON, D. C., May 7, 1907.—The State Department has made public the text of the agreement between Germany and the United States under the terms of which American products, with a few exceptions, will continue to enjoy the minimum rates of the new German tariff after July 1 next, for a period of one year and thereafter until the agreement is denounced by one of the contracting parties. The convention has been approved by the Federal Council of the German Empire, and has been laid before the Reichstag, by which it will undoubtedly be ratified at an early date, making possible its promulgation within the next fortnight. Being negotiated under section 3 of the Dingley act, the agreement does not require ratification by the Senate or the approval of Congress, but takes effect forthwith.

General Provisions of the Convention.

The agreement, which in the protocols is styled a "provisional convention," has been drafted along lines heretofore briefly sketched in this correspondence. The concessions made by the United States include: 1. The extension of the existing minor reciprocity treaty under the terms of which German argols, brandies, works of art, &c., have heretofore enjoyed special rates, to which has been added the important item of champagnes. 2. The modification of our customs regulations in a number of important particulars, which changes, however, will in the main apply to the products of all countries. 3. The agreement to recommend to Congress additional legislation for the amendment of the customs administrative laws, an agreement which is not detailed in the provisional convention, but is set forth in an accompanying memorandum.

Reciprocally, Germany concedes to the United States the minimum rates of her new tariff as to approximately 97½ per cent. of the goods annually imported from this country. In the metal schedule out of about 160 paragraphs there are 22 as to certain items of which the German tariff provides conventional rates which are not extended to the products of the United States by the terms of the provisional convention. These exceptions, however, it is stated by the commissioners who negotiated the agreement, are confined almost altogether to products of which American manufacturers ship very small quantities to Germany.

Exceptions in the Metal Schedule.

It should be understood that at the present time our exports to Germany of iron and steel and other metal products enjoy all the minimum rates of the new German tariff. After July 1, next, however, certain items of our exports included in the 22 paragraphs referred to will not enjoy such conventional rates as are therein specified, but in this connection it should be borne in mind that in many cases the conventional rates apply only to a few of the items included in the paragraphs and do not affect the more important classifications therein. The paragraphs embracing conventional rates which will not be extended to American metal products on and after July 1 next are set forth below, the rates of the general tariff being first stated and the conventional tariff rates being indicated by the letters C. T.:

	Duties per 100 kg. Marks.
778. Iron tubes of nonmalleable cast iron more than 7 mm. in thickness, rough	3.00
C. T.	2.50
Same, worked	4.50
Note.—Under convention, iron tubes and tube form pieces (Rohrenformstücke) of nonmalleable cast iron are considered as "rough" even when coated or covered with tar, or when occasional parts thereof are filled.	
791. Wire, rough or worked but not polished, lacquered or coated with other base metals or alloys thereof, having a diameter of 1.5 mm. or more	2.50
Same, 0.5 mm. and less than 1.5 mm.	3.00
Same, less than 0.5 mm.	4.50

Same, less than 0.5 up to 0.22 mm., C. T.	3.75
Note.—Under this number is conventionally included wire thinly coated with copper by means of the application during the process of drawing of a solution of copper salts.	
794. Other tubes, rolled or drawn, rough, 2 mm. or more in thickness	6.00
Same, C. T.	5.00
Same, less than 2 mm. in thickness	10.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
Note.—Rough pipes are not conventionally to be considered as "worked" if merely fitted with loose or even fixed flanges.	
798. Malleable cast iron, forgings and other wares of malleable iron not elsewhere mentioned, rough, weighing net per piece more than 25 kg.	4.50
Same, more than 150 kg., C. T.	3.50
Same, more than 100 kg. and up to 150 kg., C. T.	3.75
Same, more than 3 kg. and up to 25 kg.	6.00
Same, 3 kg. or less	8.00
Same, C. T.	6.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
799. Malleable cast iron, forgings and other wares of malleable iron not elsewhere mentioned, worked, weighing net per piece more than 25 kg.	7.00
Same, more than 150 kg., C. T.	5.50
Same, more than 100 kg. and up to 150 kg., C. T.	6.00
Same, more than 25 kg. and up to 100 kg., C. T.	7.00
Same, more than 3 kg. and up to 25 kg.	10.00
Same, 3 kg. or less	13.00
Color scrapers for cylinder printing machines of malleable iron, C. T.	10.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
806. Vises of all kinds, anvils, beak-iron, anchors and crowbars; hammers, weighing net more than 10 kg.	5.00
Vises, except those weighing net 10 kg. or less each, C. T.	3.00
807. Blocks and sheaves for pulleys; windlasses and other portable lifting tackle	7.00
Windlasses and other portable lifting tackle, C. T.	3.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
810. Scythes and sickles; forged chaff cutters	12.00
Scythes and sickles, C. T.	10.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
812. Files and rasps, not more than 16 cm. long	40.00
Files, C. T.	28.00
Same, more than 16 cm. but not more than 35 cm. long	25.00
Files, C. T.	20.00
Same, more than 35 cm. long	10.00
Tare.—Cases, 10; casks, hand files, 4; otherwise 10; baskets, 6.	
813. Drills not elsewhere mentioned; tongs or pincers, cutters for vines and roses; hedge shears; pruning shears; sheet metal shears; sheep shears; chisels; planes, tube cutters; ratchet drills; packing fillers, machine knives, taps; cutting compasses	20.00
Drills not elsewhere mentioned; taps, C. T.	15.00
Machine knives, C. T.	18.00
Tare.—Cases, 10; casks, plane irons, hewing and other chisels and other like instruments, 4; otherwise, 10; baskets, 6.	
819. Shafts, healds, malls, reeds and reed-teeth, shuttles, spools of all kinds, and similar fittings for weaving and spinning machinery	15.00
Same, C. T.	12.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
Note.—The above mentioned articles are dutiable, conventionally, at the rate of 12 marks per 100 kg., even if nickeled.	
824. Carriage springs, including railroad carriage springs, rough or only polished at the ends or edges; buffer springs	4.00
Springs for railroad carriages, buffer springs, C. T.	3.00
Same, entirely polished or worked in any other way	15.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
828. Stove pipes and rings, boxes, drums, chests, baths, curry combs, house and kitchen utensils, revolving shutters and blinds, traveling bag and portmanteau frames, bells, alarms (all these of sheet iron); also parts of such articles; rough	6.00
Same, worked	10.00
House and kitchen utensils of sheet iron, enameled, also parts of the same, C. T.	7.50
Tare.—Cases, 10; casks, 10; baskets, 6.	
895. Sewing machines (including crank embroidering machines), and knitting machines to be worked by hand, without stands; top parts of sewing machines (including those of crank embroidering machines) and of knitting machines, also parts thereof (except needles)	35.00
Knitting machines to be worked by hand, without stands; top parts of knitting machines, also parts thereof, except needles, C. T.	12.00
Tare.—Cases, 13; casks, 13; baskets, 6.	
896. Sewing machines (including crank embroidering machines) and knitting machines, firmly attached to stands or to be driven by motors	20.00
Knitting machines firmly fixed to stands, or intended to be worked by motive power, C. T.	8.00
Tare.—Case, 13; casks, 13; baskets, 6.	

904. Machines for working metal, wood or stone; steam and hydraulic forging presses; riveting machines and mechanical hammers (drop, pneumatic and spring hammers, and other hammers driven by transmitted power); each machine weighing net 250 kg. or less.....	20.00
Same, C. T.....	12.00
Same, more than 250 kg. and up to 1000 kg.....	12.00
Same, C. T.....	8.00
Same, more than 1000 kg. and up to 3000 kg.....	8.00
Same, C. T.....	6.00
Same, more than 3000 kg. and up to 10,000 kg.....	6.00
Same, C. T.....	5.00
Same, more than 10,000 kg.....	4.00
Tare.—Case, 13; casks, 13; baskets, 6.	
906. Other machinery not specially mentioned, each machine weighing net 40 kg. or less.....	15.00
Same, more than 40 kg. and up to 100 kg.....	12.00
Same, more than 100 kg. and up to 200 kg.....	10.00
Same, more than 200 kg. and up to 400 kg.....	9.00
Same, more than 400 kg. and up to 1000 kg.....	7.00
Same, more than 1000 kg. and up to 5000 kg.....	5.50
Same, more than 5000 kg. and up to 10,000 kg.....	4.50
Same, more than 10,000 kg.....	3.00
Millers' machinery, each machine weighing net more than 400 kg. and up to 4000 kg., C. T.....	5.00
Same, more than 4000 kg. and up to 10,000 kg., C. T.....	4.00
Pumps, including exhausting machines, each machine weighing net more than 100 kg. and up to 200 kg., C. T.....	7.00
Same, more than 200 kg. and up to 400 kg., C. T.....	6.00
Same, more than 400 kg. and up to 1000 kg., C. T.....	5.00
Same, more than 1000 kg. and up to 10,000 kg., C. T.....	4.00
Bakers' and pastry ware makers' machinery, machinery for testing materials; each machine weighing net more than 1000 kg. and up to 5000 kg., C. T.....	5.00
Blowing machines (including ventilating machines), machines for sorting, scouring or crushing coal and ores, machines for molding coal briquettes, mortar crushing machines, lifting machines (including mining machines), freezing machines, machines for polishing plate glass, machines for manufacturing and working beaver hat shapes; each machine weighing net more than 100 kg. and up to 200 kg., C. T.....	7.00
Same, more than 200 kg. and up to 400 kg., C. T.....	6.00
Same, more than 400 kg. and up to 1000 kg., C. T.....	5.50
Same, more than 1000 kg. and up to 5000 kg., C. T.....	5.00
Same, more than 5000 kg. and up to 10,000 kg., C. T.....	4.50
Same, more than 10,000 kg., C. T.....	3.00
Tare.—Case, 13; casks, 13; baskets, 6.	
907. Dynamos, electric motors, continuous current transformers, as well as finished armatures and collectors, converters and reaction coils, each machine weighing net 500 kg. or less.....	9.00
Same, more than 500 kg. and up to 3000 kg.....	7.00
Same, C. T.....	6.00
Same, more than 3000 kg.....	6.00
Same, more than 3000 kg. and up to 10,000 kg., C. T.....	5.00
Same, more than 10,000 kg., C. T.....	4.00
Tare.—Case, 13; casks, 13; baskets, 6.	
Note.—Machines firmly attached to dynamo generators or motors are subject to duty as machines and not as electrical apparatus. When articles specified in No. 907 are imported in an unfitted condition it is agreed conventionally that the rules relating to the customs treatment of unfitted machines shall apply.	
912. Telegraph appliances, electrical; telephones; electric appliances for illumination, transmission of power, or electrolysis, and for medical or dental purposes; electric measuring, counting and registering apparatus; resistances and shunts; galvanic and dry batteries and thermo-electric couples; other electrical appliances; component parts of such articles.....	60.00
Electric appliances for illumination, transmission of power or electrolysis; electric measuring, counting and registering apparatus; resistances and shunts; other electrical appliances not specially mentioned and component parts of such articles, each article weighing net 10 kg. or less, C. T.....	40.00
Same, more than 10 kg. and up to 25 kg., C. T.....	30.00
Same, more than 25 kg. and up to 100 kg., C. T.....	20.00
Same, more than 100 kg. and up to 500 kg., C. T.....	8.00
Same, more than 500 kg. and up to 1000 kg., C. T.....	6.00
Same, more than 1000 kg., C. T.....	4.00
Insulating coils, bells and buttons, bobbins, keys, switches and similar parts of electrical fittings of earthenware, porcelain or glass, not combined with other materials and not admitted as parts of electro-technical appliances imported in sections, white, C. T.....	10.00
Same, colored, C. T.....	20.00
Insulating appliances (bobbins, safety boxes, tubes, disks, rings and the like) of asbestos, asbestos paste, mica or micaite, for electro-technical purposes, C. T.....	15.00
Tare.—Cases, 13; casks, 13; bales, 6.	
916. Cycles, including those intended for the transport of passengers or goods or attached to other vehicles.....	150.00

Same, C. T.....	100.00
Tare.—Cases, 13; casks, 13; baskets, 6.	
919. Parts of cycles (except motive machinery and parts thereof), of iron, rough.....	40.00
Same, C. T.....	25.00
Same, worked.....	150.00
Same, C. T.....	100.00
Tare.—Cases, 10; casks, 10; baskets, 6.	
920. Parts of cycles of other common metals or alloys of such metals, of wood, cork, vulcanite, horn, leather or celluloid, or other similar molding materials; finished wheels for cycles.....	150.00
Same, C. T.....	100.00
Tare.—Cases: wooden rims for cycles, 16; otherwise 13; casks: wooden rims for cycles, 16; otherwise 13; baskets, 6; bales containing wooden rims for cycles, 6.	

Application of Rates.

In analyzing the above table, the conditions of the convention should be carefully noted. In paragraph 778, for example, cast iron tubes more than 7 millimeters in thickness are dutiable under the general tariff at 3 marks per hundred kilograms, while the conventional rate is but 2.50 marks. The same tubes, treated in any manner except as indicated in the accompanying note, pay a rate of 4.50 marks under the general tariff, but the conventional tariff provides no reduction from this rate. American tubes will therefore pay 3 marks if rough and 4.50 if advanced from the rough condition. The competitors of American manufacturers shipping from countries enjoying the full conventional tariff of Germany will receive a concession only on the rough tubes.

The fact that American metal working machinery is excluded from the conventional rates will no doubt attract much attention and may arouse some criticism. The commissioners state, however, that inquiry demonstrated that the imports into Germany of this class of machinery were comparatively small, and in many cases the machines were imported solely for the purpose of using them as models or patterns.

Changes in Customs Regulations.

The changes which the Treasury and State departments will make in the customs and consular regulations under the terms of the provisional convention are far reaching. They are set forth succinctly in the following memorandum addressed to the German Ambassador by the Secretary of State:

Referring to the commercial agreement signed this day between the Imperial German Government and the Government of the United States, I have the honor to inform you that instructions to the customs and consular officers of the United States and others concerned will be issued to cover the following points and shall remain in force for the term of the aforesaid agreement:

a. Market value as defined by section 19 of the Customs Administrative act shall be construed to mean the export price whenever goods, wares and merchandise are sold wholly for export, or sold in the home market only in limited quantities, by reason of which facts there cannot be established a market value based upon the sale of such goods, wares and merchandise in usual wholesale quantities, packed ready for shipment to the United States.

b. Statements provided for in section 8 of the customs administrative act are not to be required by consular officers except upon the request of the appraiser of the port, after entry of the goods. The consular regulations of 1896, paragraph 674, shall be amended accordingly.

Open Hearings Conceded.

c. In reappraisal cases the hearing shall be open and in the presence of the importer or his attorney, unless the Board of Appraisers shall certify to the Secretary of the Treasury that the public interest will suffer thereby; but in the latter case the importer shall be furnished with a summary of the facts developed at the closed hearing upon which the reappraisal is based.

d. The practice in regard to "personal appearance before consul," "original bills," "declaration of name of ship," shall be made uniform in the sense:

1. That the personal appearance before the consular officers shall be demanded only in exceptional cases, where special reasons require a personal explanation.

2. That the original bills are only to be requested in cases where invoices presented to the consular officer for authentication include goods of various kinds that have been purchased from different manufacturers at places more or less remote from the consulate, and that these bills shall be returned after inspection by the consular officer.

3. That the declaration of the name of the ship in the invoice shall be dispensed with whenever the exporter at the time the invoice is presented for authentication is unable to name the ship.

Paragraph 678 of such regulations, as amended March 1, 1900, shall be further amended by striking out the words, "Whenever the invoice is presented to be consulated in a country other than the one from which the merchandise is being directly exported to the United States," and by inserting after the first sentence the following clause: "As place in which the merchandise was purchased is to be considered the place where the contract was made, whenever this was done at the place where the exporter has his office."

Paragraph 681 of the consular regulations of 1896, relative to the "swearing to the invoice," shall be revoked.

c. Special agents, confidential agents and others sent by the Treasury Department to investigate questions bearing upon customs administration shall be accredited to the German Government through the Department of State at Washington and the Foreign Office at Berlin, and such agents shall co-operate with the several chambers of commerce located in the territory apportioned to such agents. It is hereby understood that the general principle as to *persona grata* shall apply to these officials.

f. The certificates as to value issued by German chambers of commerce shall be accepted by appraisers as competent evidence and be considered by them in connection with such other evidence as may be adduced.

It was announced some weeks ago that the Treasury Department would abandon its secret customs service in Germany, but although this was at one time contemplated, it was finally decided to maintain the service, but to put it on a different footing, accrediting the agents to the German Government substantially in the same manner pursued with respect to United States consuls.

To Amend the Customs Administrative Law.

While not specifically embraced in the provisional convention, the general agreement includes a pledge on the part of the Administration to recommend to Congress the amendment of section 7 of the Customs Administrative act of June 10, 1890, in a number of very important particulars. As set forth in a memorandum prepared by the Secretary of State, Congress will be asked to modify this section to read as follows:

That the owner, consignee or agent of any important merchandise may at the time when he shall make and verify his written entry of such merchandise, but not afterward, make such addition in the entry to or such deductions from the cost or value given in the invoice or *pro forma* invoice or statement in form of an invoice, which he shall produce with his entry, as in his opinion may raise or lower the same to the actual market value or wholesale price of such merchandise at the time of exportation to the United States in the principal markets of the country from which the same has been imported; and the collector or within whose district any merchandise may be imported or entered, whether the same has been actually purchased or produced otherwise than by purchase, shall cause the actual market value or wholesale price of such merchandise to be appraised; and if the appraised value of any article of imported merchandise subject to the ad valorem duty or to a duty based upon or registered in any manner by the value thereof shall exceed the value declared in the entry by more than 10 per cent. there shall be levied, collected and paid, in addition to the duties imposed by law on such merchandise, an additional duty of 1 per centum of the total appraised value thereof for each 1 per centum in excess of 10 per centum that such appraised value exceeds the value declared in the entry; but the additional duties shall only apply to the particular article or articles in each invoice that are so undervalued, and shall not be imposed upon any article upon which the amount of duty imposed by law on account of the appraised value does not exceed the amount of duty that would be imposed if the appraised value did not exceed the entered value, and shall be limited to 25 per centum of the appraised value of such article or articles.

Such additional rates shall be construed to be penal and within the purview of sections 5292 and 5293, Revised Statutes, and sections 17 and 18, act June 22, 1874, and further, shall be remitted in cases arising from unintentional or manifest clerical error; but these duties shall not be refunded in case of exportation of the merchandise, nor shall they be subject to the benefit of drawback; provided, that if the appraised value of any merchandise shall exceed the value declared in the entry by more than 35 per centum, except when arising from an unintentional and a manifest clerical error, such entry shall be held to be presumptively fraudulent, and the collector of customs may seize such merchandise and proceed as in the case of forfeiture for violation of the customs laws; and in any legal proceeding that may result from such seizure the undervaluation as shown by the appraisal shall be presumptive evidence of fraud and the burden of proof shall be on the claimant to rebut the same, and forfeiture shall be adjudged unless he shall rebut such presumption of fraudulent intent by sufficient evidence. The forfeiture provided for in this section shall only apply to the particular article or articles which are undervalued.

Provided, further, that all additional duties, penalties or forfeitures applicable to merchandise entered by a duly certified invoice shall be alike applicable to merchandise entered by a *pro forma* invoice or statement in the form of an invoice. The duty shall not, however, be assessed in any case upon an amount less than the entered value.

Effect of Proposed Changes.

The proposed amendments to section 7 of the act of June 10, 1890, embody the following changes: 1. Giving to the owners of consigned merchandise the same privilege that is enjoyed by the consignees of purchased merchandise—namely, to add on entry to the invoice value in order to make market value. 2. To deduct from the invoice value of both consigned and purchased goods in order to make market value. 3. Additional duties are not to be levied within a margin of 10 per cent. 4. *Prima facie* evidence of fraud arises where the merchandise is undervalued 35 per cent. instead of 50 per cent., as heretofore. 5. Penal duties assessed for undervaluation are to be treated as penalties and not as duties, thus giving the Secretary of the Treasury authority to remit such penalties when the fact is demonstrated that no fraud was attempted. 6. Penal duties are not to be assessed on goods paying specific duties where the rate of duty is not changed as a result of the advance in value by the appraiser.

It has frequently occurred, in fact more frequently than otherwise, that additional duties are assessed and collected in cases where the importer in stating the value of his merchandise acted with the utmost good faith, and although the Secretary of the Treasury is fully aware of the fact that the assessment of such duties is a manifest hardship he is expressly denied the right to take any remedial action. This condition may arise by reason of a misconception of the facts, unintentional error, the rendition of a decision by the appraiser or Board of General Appraisers after the shipment of the goods and before their arrival in this country, and in other ways, without any bad faith on the part of the importer, and notwithstanding the fact that the additional duties are assessed and collected, and the Secretary of the Treasury has no power to remit or abate them. Under the proposed bill presumption of fraud arises at the point where a 35 per cent. undervaluation is reached, instead of 50 per cent., and inasmuch as the duties are construed to be penal, the Secretary of the Treasury is authorized under section 5292 of the Revised Statutes to hear and determine whether the case involved an attempted fraud or not, and if he shall be satisfied that no fraud was involved to remit the penalty.

Taken as a whole, the proposed amendments to section 7 will constitute highly important concessions to the importing interests, and, of course, will apply to the products of all countries and will not be confined to those of Germany. This statement also applies to the changes in the customs regulations referred to by Secretary Root in his note to the German Ambassador.

No Necessary Safeguards Relaxed.

It is probable that there will be some criticism of the concessions made to importers on the ground that they tend to relax the safeguards heretofore thrown about the revenues, especially in the matter of the acceptance of export values instead of domestic values as the bases of invoices. There is believed to be very little ground for such criticism. It is certainly a pertinent and highly interesting fact that in the appraisement of over \$300,000,000 worth of merchandise imported during 1906 the total of the advance made was less than \$3,000,000, which demonstrates conclusively that the amount involved in the modifications embodied in the provisional convention and accompanying memorandum is only a small fraction of 1 per cent., for in the great majority of cases exported goods have a recognized domestic market value which, whenever existing, must be stated in the invoice. Export prices can only be quoted in the rare instances in which the goods are made almost exclusively for foreign consumption and are not sold for domestic use "in usual wholesale quantities."

W. L. C.

The Harbison-Walker Refractories Company, Farmers Bank Building, Pittsburgh, has purchased 22 acres of land at Indiana Harbor, Ind., and is now erecting a new firebrick works there, which will have a daily capacity of 60,000 per day. Plenty of room is provided for future extensions. The plant will be built of brick and concrete, and will be fireproof throughout.

The Strawberry Valley Tunnel Project.

Some most interesting engineering work is being undertaken in connection with the Reclamation Service of the United States Coast and Geological Survey. One of the more recent of these undertakings has been inaugurated near Vernal, Utah, known as the Strawberry Valley tunnel project. It includes the irrigation of several thousand acres of productive soil in the southern part of Utah County. A storage dam having a capacity of about 4,356,000,000 cu. ft. and reaching a height of 45 ft. will be thrown across the Strawberry River. Water from this reservoir will be led through a tunnel more than $3\frac{1}{2}$ miles long to the distribution points, where it will be diverted into canals for irrigating the various ranches.

The construction of this dam will make possible the electrical development of a considerable water power, and a power house having a capacity of 2250 kw. is contemplated. The power will be used not only for lighting various surrounding small towns, but for motor driven centrifugal irrigating pumps. A temporary power house will be erected at once at Spanish Fork, some 33 miles from the construction camp, so that electricity will be available for building operations. The electrical equipment will form the nucleus of the plant, which will eventually be installed on the Strawberry River.

The electrical equipment for this temporary power plant will be furnished by the General Electric Company. The initial apparatus includes two 425-kw., three-phase, alternating current generators, directly connected to Leffel water wheels. The generators will furnish current at a potential of 11,000 volts to step-up transformers, which in turn will raise the voltage to 22,000 for transmission. Two belt driven 45-kw. generators will supply direct current at a potential of 125 volts for excitation purposes. Switchboard equipment will be provided for both the main station and two substations.

At the substations motor generator sets will be installed for supplying direct current for hoisting motors and other purposes. The motor generator sets consist of 75-kw. and 50-kw. direct current machines, each directly connected respectively to a 157-hp. and a 125-hp. 2080-volt induction motor. The shafts of the induction motors are belted to air compressors, supplying compressed air for driving rock drills. On account of the double duty which they perform, the induction motors are of the comparatively large capacity indicated.

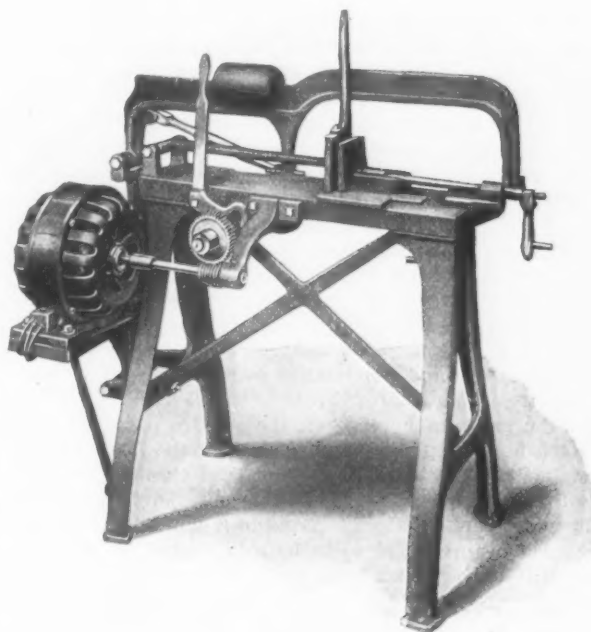
Work on the tunnel has already started, but will be greatly facilitated when the temporary power house is completed, since the operations up to the present have been handicapped by the employment of small gasoline engines for power.

The New Wickwire Furnace at Buffalo.—The Wickwire Steel Company, recently incorporated at Buffalo with a capital of \$1,000,000, as an auxiliary of Wickwire Brothers, Cortland, N. Y., manufacturers of wire, wire nails, wire cloth, wire netting, &c., has purchased 60 acres of land fronting on Niagara River, about 1 mile north of Buffalo, including Rattlesnake Island, upon which it is the intention to begin at once the construction of a blast furnace, with ore docks about 1000 ft. long, equipped with ore handling machinery and all the other essentials of a pig iron making plant. It expects to have the furnace ready for operation within a year. The capacity of the plant at the outset will be 300 tons per day, and a considerable portion of the output will be shipped to Cortland, to be manufactured into the company's products there. Any excess of pig iron produced above the company's requirements at Buffalo or Cortland will be marketed. The Cortland plant is not to be moved to Buffalo, but, on the contrary, is to be operated on a more extensive scale than heretofore, and about \$150,000 is being spent on improvements and enlargements there. Julian Kennedy of Pittsburgh is construction engineer for the new plant, and some of the preliminary contracts have been let. The site purchased, in addition to having Niagara River frontage, will have the advantage of the new Niagara Ship Canal and be intersected by the en-

larged Erie Canal, and will have rail connection with the New York Central Railroad and with the Buffalo, Lake Erie and Niagara Terminal Railroad, which is soon to be built. The new company has opened offices on the tenth floor of the White Building, Buffalo.

A Motor Driven Hoefer Hack Saw.

The application of a direct motor drive to a power metal sawing machine, made by the Hoefer Mfg. Company, Freeport, Ill., is shown in the accompanying illustration. In order to secure the necessary reduction of speed for economical operation of the machine a worm drive is used. The worm is fitted to an extension of the motor shaft, which has an outer end bearing supported by a bracket arm bolted to the side of the machine frame. The saw is driven at a reasonable steady speed that favors square, even cuts. The machine is entirely automatic in its operation. When a cut is finished the blade is lifted from the work and the machine is stopped by automatic disengagement of a clutch on the motor shaft. The motor rests on a bracket bolted to the rear of the



A Power Hack Saw with Contained Motor Drive, Made by the Hoefer Mfg. Company, Freeport, Ill.

machine. The improved design of this machine is the result of a growing demand for individual motor driven units.

An example of the manner in which repair work is now being rushed through is shown in the Soho Furnace of the Jones & Laughlin Steel Company, Pittsburgh, which was blown in April 30, after having been out since March 5, for complete relining. During this time two new columns, a new mantle and the first sheet above the mantle were put in; a new water system complete, including a 75 x 16 ft. water tower and a new down comer, dust catcher and centrifugal dust separator were installed, and various changes were made in the gas and hot blast mains. E. L. Messler, general superintendent of the company's works, may well feel proud of the achievement.

Both the Pittsburgh and New York offices of Joseph T. Ryerson & Son, Chicago, dealers in iron, steel and machinery, have been removed to new locations. The Pittsburgh office, formerly in the Farmers' Bank Building, is now located at 1072-1073 Frick Annex Building, and the New York office has been removed from 17 State street to 74 Broadway. In each instance the change brings these branches into districts largely occupied by iron, steel and machinery interests.

The Centrifugal Dust Collector for Blast Furnaces.

BY FRANK C. ROBERTS, PHILADELPHIA.

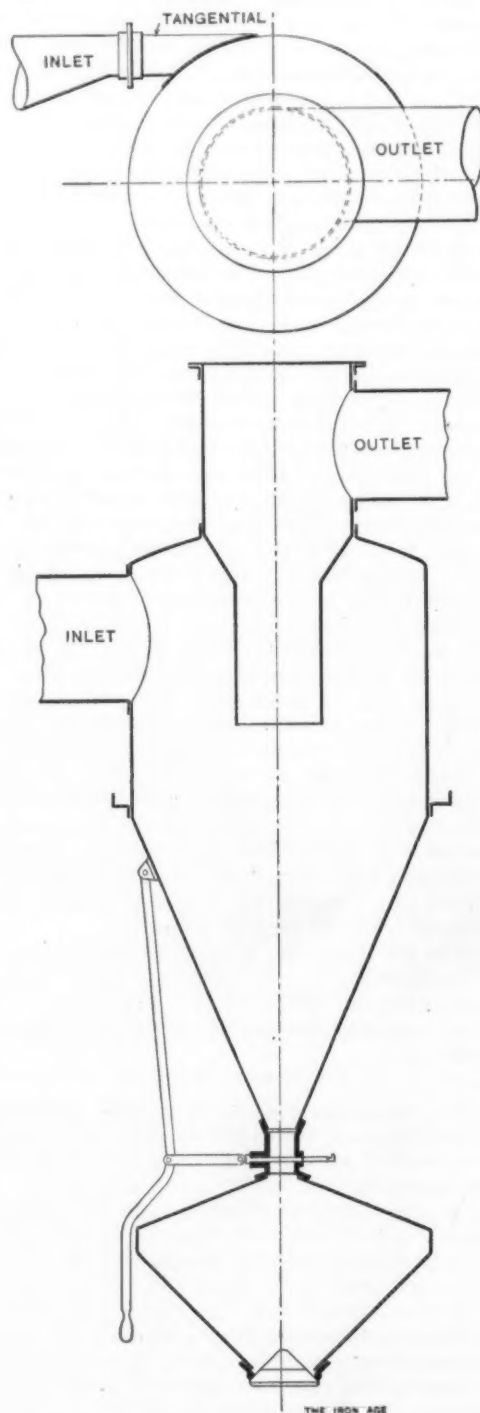
As the requirements of economical production become more severe, the removal of dirt and dust from the waste gases of the blast furnace assumes increasing importance. But little attention was paid to the lack of efficiency in stoves and boilers and to the cost of labor in cleaning these parts until, through the introduction of fine ores and hard driving, these factors affected in an important way the cost of production. The comparatively recent application of furnace gases to the gas engine has further accentuated the necessity for dust removal, until to-day the problem is one of the most serious confronting the iron industry.

The development of gas cleaning devices has been gradual. Beginning with various modifications to the interior of the dust catcher at the foot of the down-comer, it was a natural step to introduce additional dust catchers and pockets in the gas mains. These devices were more or less effective in the removal of the coarser dirt, but the finer dirt or dust still remained in suspension and was carried by the gases and deposited in the stoves and boilers. The solution of the problem then spread out along the line of gas washing, as supplemental to the dry dust catchers. This first took the form of a water spray, but it was found that the quantity of water required to reduce the temperature of the gases to a point where they would not take up moisture was so great as to be prohibitive from the standpoint of economy when considered in the light of advantage to hot blast stoves and boilers, for at that time the gas engine had not reached its present state of development. As a rule these spray washers were equipped at the bottom with a water pan, and it was found upon shutting off the sprays and providing a water supply at or near the bottom that improved results were secured by allowing the gases to impinge on the surface of water contained in these pans, whereby much of the fine dirt was retained by the water and discharged through a water sealed overflow. This led to various developments of the water pan, both by itself and in combination with the dust catcher, resulting in various degrees of satisfaction, but still leaving much to be desired.

First Experiments with Centrifugal Separation.

During all these stages of development it was generally admitted that the use of water was disadvantageous, in that it involved loss of sensible heat, absorption of moisture and much difficulty in the disposal of the accumulated dust, owing to its wet and sticky condition. All of this would be avoided by the use of a dry process of separating the dust from the gases. Some years ago the writer directed his attention to the separation of dust by means of centrifugal force, and through the interest of B. Dawson Coleman certain experiments were conducted by him and the writer's firm at the Lebanon furnaces, at Lebanon, Pa. It was feared at the outset that in order to secure the velocity of gases necessary for separation it would be impossible to utilize the gas pressure due to the furnace without restricting the openings to such an extent as to increase the furnace top pressure beyond a desirable point. The first experiment, therefore, involved the use of a fan having a chamber inclosed by an outer casing for the collection of the dust, with openings leading thereto through the usual casing from the wheel space of the fan. The results were not satisfactory, and the apparatus was also objectionable, in that it involved the use of power other than that furnished by the pressure of gas. We therefore returned to the original idea of adopting the device so generally used in woodworking plants and known as the "centrifugal dust collector," "cyclone separator," &c., and determined to make an experiment depending upon the pressure of the gas for the power required. A small experimental collector was first constructed, and the result proving satisfactory a larger one was built and connected to one of the fire brick stoves in such manner

that all the gas for this stove was passed through the separator. This separator was in use for several months, with the result that Mr. Coleman decided to install a collector large enough to take care of all the gases from his No. 1 furnace. After the latter collector had been in use for upwards of a year the No. 3 furnace at this plant was equipped in like manner. In consequence of the experience at the Lebanon furnaces the centrifugal type of dust collector has been installed at a number of



Plan and Section of Centrifugal Gas Cleaner.

furnace plants with extremely satisfactory results in all cases. It is found that after passing through the collector the gases contain but a very small quantity of finely divided dust of a character that does not fuse in the combustion chambers of either the stoves or the boilers, a condition which renders trifling the expense of cleaning these parts.

Fineness of the Dust Collected.

As evidence of the character of the dust extracted from furnace gases by these collectors the following

tests are submitted, being the result of samples taken from collectors in actual daily use:

	Per cent.
Retained on 30-mesh sieve.....	5.25
Retained on 50-mesh sieve.....	2.00
Retained on 100-mesh sieve.....	8.30
Passed through 100-mesh sieve.....	84.45

It is interesting to know that the flue dirt taken from the ordinary dust catcher at the bottom of the down comer of the same furnace gives the following results:

	Per cent.
Retained on 50-mesh sieve.....	55.40
Retained on 80-mesh sieve.....	19.00
Retained on 100-mesh sieve.....	7.20
Passed through 100-mesh sieve.....	18.40

The flue dust taken from the collector at another furnace gives the following results:

	Per cent.
Retained on 40-mesh sieve.....	0.50
Retained on 60-mesh sieve.....	2.70
Retained on 100-mesh sieve.....	8.90
Passed through 100-mesh sieve.....	87.89

When it is realized that a 100-mesh sieve contains 10,000 openings to the square inch the fineness of the dust removed from the gases by this form of collector is appreciated.

Better Results from More Collectors.

So far the installations have comprised single collectors placed in the line of the gas main. It would appear, however, that if two or more collectors were placed in series, arranged so that the gas would pass through them successively, the results would be still more satisfactory. It is believed that the centrifugal type of dust collector is the most satisfactory solution yet attained of the problem of cleaning gases for use in stoves and boilers, and that it will be found to be the most desirable method of preliminary treatment of gas for use in gas engines. Two or more centrifugal dust collectors in series would very materially reduce the work to be performed by washing.

The writer is informed that some years ago James P. Witherow built at one or more furnaces in Virginia a dust collector in which the centrifugal feature was utilized. Apparently the results secured were not such as to warrant the adoption of the apparatus, since it was not embodied in plants constructed subsequently by Mr. Witherow. The recent development of the centrifugal form of dust collector has led, however, to a revival of the Witherow construction.

Tangential Gas Inlet.

The design and arrangement of centrifugal dust collector which, in our experiments, has proved the most satisfactory, is that shown in the accompanying plan and sectional illustrations. It is to be noted that the gas inlet is tangential to the collector and that the outlet is centrally located at the top of the collector. Below the collector proper is placed a pocket, into which the dust is discharged from the collector. This pocket is necessary, in order to remove the dust which has been separated out of the path of the whirling gases. The contents of the pocket are discharged through the bottom by lowering a bell counterweighted so that normally it keeps the outlet closed. In order to prevent the entrance of air into the collector when the bell at the bottom of the pocket is lowered, a valve is placed between the collector and the pocket. This is closed when the pocket is being discharged of its contents, but at other times is open, in order to permit the free passage of dust into the pocket. Under certain conditions the whirling gases within the collector create a vacuum at the center of the dust discharge opening, thus inducing air to enter the collector. It is evident that the closing of the valve between the collector and the pocket prevents the entrance of air when the pocket is being discharged.

As a rule the dust collector is located over a railroad track, so that the contents of the pocket may be discharged directly into a railroad car. The dust is dry and is, therefore, handled at a minimum cost. These collectors are constructed under a patent granted to W. L. Wallis.

The Pittsburgh Traffic Club.

The fifth annual dinner of the Pittsburgh Traffic Club was held in the Hotel Schenley, Pittsburgh, on the evening of April 26, and was very successful from every standpoint, 451 persons being present, including representatives of prominent railroads all over the country. W. A. Terry, general freight agent of the Pittsburgh & Lake Erie Railroad at Pittsburgh, president of the club, delivered an address, in the course of which he stated that the total rail and river tonnage of the Pittsburgh District, which in 1905 was 110,000,000 tons, in 1906 reached the enormous total of 123,000,000 tons. He also cited the fact that the Pittsburgh District produces 25 per cent. of the total output of pig iron made in the United States and 55 per cent. of the total output made in Pennsylvania. Pittsburgh also made last year nearly 40 per cent. of the total output of Bessemer and open hearth steel in the United States. Mr. Terry regretted that the Interstate Commerce Commission had neither an experienced railroad man nor manufacturer as one of its members and suggested that the commission should have associated with it in confederal capacity a committee representing these two interests. In the absence of this arrangement he urged that every interest cooperate with the commission for enlightenment on questions needing action. He believed the greatest move shippers and carriers of Pittsburgh ever made was when they began the principle of confederal adjustments. He continued:

The carrier profits most when the shipper works with least restriction, and the shipper succeeds best when he facilitates transportation most, and one needs little more to prove that this spirit has worked to wonderful advantage than the simple statement that while during the past two years the tonnage of the country increased a little less than 20 per cent. the tonnage of the Pittsburgh District increased 41 per cent. And to show that that great increase was accomplished by co-operation and energy of carriers jointly with the enterprise of shippers another item is of interest: The increase in car capacity for the same period throughout the United States was a little over 15 per cent., while the Pittsburgh railroads increased theirs 29 per cent.; and while the traction power of engines through the United States during the same period was increased 15½ per cent., that of the roads serving Pittsburgh increased nearly 31 per cent. And this is not all. The roads serving Pittsburgh added to their tracks during those two years nearly 2000 miles in main track and other track facilities—enough to form a double-track road from Pittsburgh to Chicago and another double line from Pittsburgh to New York. If present plans of the roads are carried out, the improvement in equipment and other facilities will find the carrier performing his full part in the upbuilding of this district.

It is to be hoped, however, that the Pittsburgh roads may early have the benefit, not only of new equipment, but that which is now scattered to the four winds of heaven, and that an understanding between railroads may be reached that will give the owners of cars either their own or the equivalent of them in the general circulation of cars in trade; and with the present facilities for financing legitimate plans for car purchase, there is no reason for any railroad in this country being without sufficient cars to take care of all the tonnage it produces.

Interesting addresses were also made by M. E. Ingalls, chairman of the Board of Directors of the Big Four Railroad, and Charles S. Hamlin, corporation counsel of the Boston Chamber of Commerce.

The product of the Pennsylvania Steel Company's works, at Steelton, Pa., during the month just closed was the largest of any of the months of 1907, although it is stated that it was not a record breaker. All of the furnaces and mills were in full operation. Shipments were heavy, and the number of men on the rolls is the largest for a long time. The company will probably start one of its new open hearth steel furnaces about the middle of this month. The finishing touches are now being put to this furnace, which will be one of five, each of 75 tons capacity. The company will start the others, as they are completed. The operation of these furnaces will add to the number of men employed at the plant and give it a much increased product.

A cargo of iron ore, consisting of 3540 tons, arrived at Philadelphia May 2 from Oxelosund, Sweden, on a Norwegian steamship, being the first Swedish ore imported at that city.

Weldless Chain Manufacture.

The Process Employed by the Handelsgesellschaft Kleinberg & Co., Vienna, Austria.

The familiar saying that the strength of a chain is in its weakest link might in the case of chains with welded links be even more definitely stated—the strength of a chain is in its weakest weld. The strength of a welded chain always is more or less uncertain, for the best weld cannot be as strong as the solid metal of the same section, and even with the most exact and uniform processes of welding an imperfect weld occasionally results. This condition has made it an object to get around the necessity of welding and to produce a weldless chain. Of the processes that have been put forward one of the most interesting is that invented by an Austrian engineer, Stefan von Ecseghy of Vienna, for making a chain of the form in which each link consists of two eyes at right angles to each other, resembling a twisted figure 8. One eye is formed by bending the stock at the middle and the

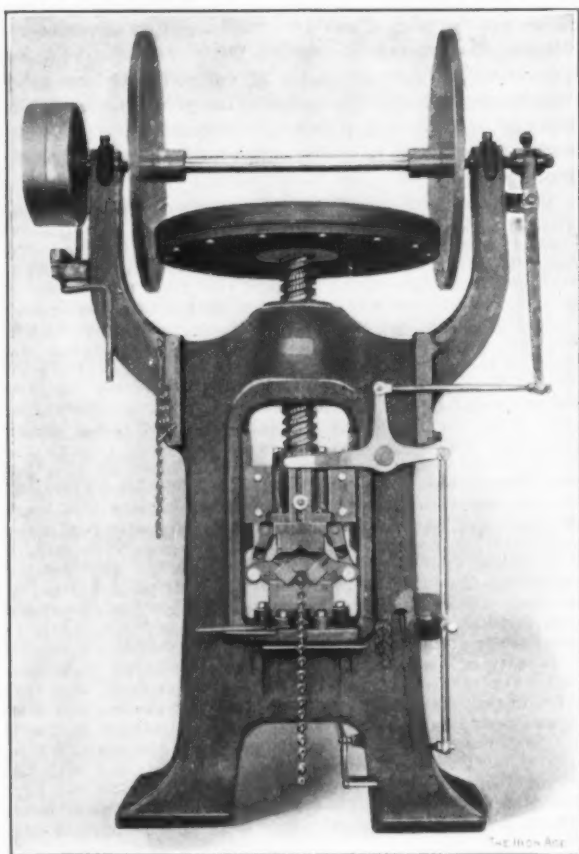


Fig. 1.—A Screw Press Equipped for Making Weldless Chains.

other by flattening and punching the ends and pressing them together. More in detail the work is accomplished as set forth in the following description.

The apparatus consists of a forge for heating the blanks and a press for forging, punching and forming the links in a continuous chain. Mechanically the interest centers in the working mechanism of the latter machine. Fig. 1 illustrates a friction driven screw press equipped with the ingenious dies that are the fundamental requisite of the process. Any other form of press with reciprocating head or a drop hammer could be equally well employed, and in fact a crank press would perhaps be preferred by an American designer. The essential part is the mechanism comprising dies, levers and connecting links, which is shown connected between the head and bed of the press.

The blanks from which the chains are made by this process are straight rods of the form shown in Fig. 2, having a transverse section through the central part equal in diameter to the section of the link to be made, while the ends are somewhat thicker and oval in section. The blank is threaded through the eye of the last completed

link, as shown in the lower view of Fig. 2, and the two together are put between the dies shown in Fig. 3. The blank on being placed in the press occupies the position shown by the dotted lines in Fig. 3. By the action of the dies the ends of the blank are set down on each side of the central portion and are shaped into two equal half round rings, flat on the lower side, as shown by the full lines. The plan view of the link at this stage is shown in the lower part of Fig. 3. In the succeeding operation the lower die, which is in two parts hinged at the center, is folded together, bending the central portion of the blank to form one eye and pressing the rings at its ends

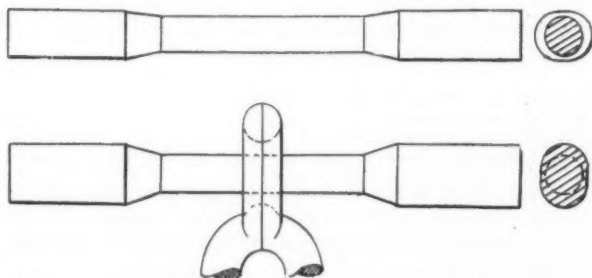


Fig. 2.—A Link Blank Ready to Be Placed in the Press.

together with their flat sides in contact, forming the eye at right angles to the first eye. This link is now complete, and the next blank can be threaded through it and formed into a link by a repetition of the process just described. Fig. 4 shows a section of the chain so formed, with the last link opened to illustrate the direction of bending in closing the link.

The length and thickness of the end portions of the blank, Fig. 2, are proportioned so as to afford the proper quantity of material for forming the rings at the ends of the blank, with holes through them of sufficient size to pass the thickened ends of the blank. They are, however, much smaller than would be necessary if the completed half round ring at the end had to be threaded through.

The blanks from which the links are made are formed as follows: To make $\frac{1}{2}$ -in. chain bar stock about $\frac{5}{8}$ in. in diameter is used. This is cut to length, heated, placed between swedges, and under a steam hammer the central portion is reduced to a section of exactly $\frac{1}{2}$ in., while the two ends remain of their original diameter. The holes through the links being about 11-16 in., a new rod can be easily threaded through the last completed link. It is also possible to make the blanks by rolling the bar,

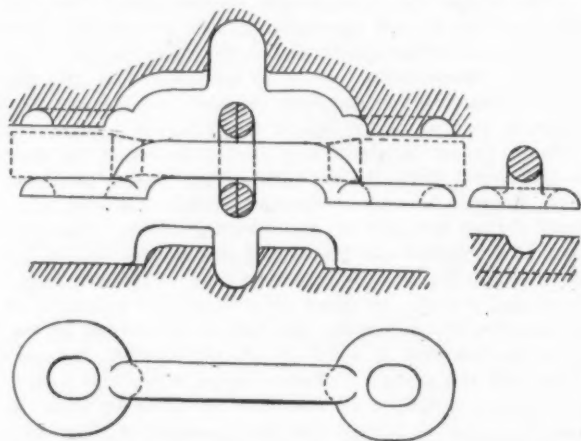


Fig. 3.—The Dies and the Effect of the Down Stroke.

reducing its section at the proper intervals and finally separating the individual blanks with a shear. In this more rapid process about 1000 to 2000 blanks per hour can be made. A still more advanced scheme projected is a more completely automatic chain making machine in which it will not be necessary to use formed blanks. The machine will take $\frac{1}{2}$ -in. bar iron, thread it through the links, cut it to length and upset the two ends, obtaining the same effect as before.

The advantages claimed for this process over others

are that it is cheaper, less complicated, and that with it chains can be made of steel as well as iron. In other processes involving welding it is necessary to use a very high heat, which is detrimental to steel. In the process described it is only necessary to use a cherry red heat for

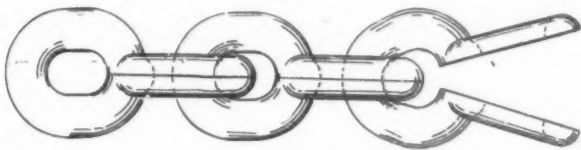


Fig. 4.—A Section of Weldless Chain Showing How It Is Assembled.

either steel or iron. The desirability of making chains of steel is obvious—the greater strength for the same weight or size—and this more than offsets the slight difference in cost between steel and iron. The fact that this process makes it possible to make chains of steel gives it an unusual commercial value.

The following table gives the results of tensile tests made at the Sheffield Testing Works, Sheffield, England, on two weldless $\frac{1}{2}$ -in. chains, one of iron and one of steel:

	Iron.	Steel.
Diameter, inches.....	0.48	0.52
Area, square inches.....	0.181	0.222
Distance between gauge points, inches.....	2	2
Elongation, inches.....	0.34	0.45
Elastic stress, tons.....	3.29	5.93
Elastic stress, tons per square inch.....	18.18	27.97
Ratio of elastic to maximum stress, per cent.....	71.5	70.2
Maximum stress, tons.....	4.6	8.45
Maximum stress, tons per square inch.....	25.42	39.86
Elongation, per cent.....	17.0	22.5
Reduction of area, per cent.....	37.6	51.9
Breaking load of chain, tons.....	7.34	9.5

The fracture of the iron was fibrous and badly laminated, and that of the steel silky fibrous.

Up to the present time no other sizes have been made, so that the breaking strains are not known by test, and can only be calculated on the basis of the strength of the $\frac{1}{2}$ -in. chain.

The best welded chain of $\frac{1}{2}$ -in. link cross section has a maximum breaking strength of about six tons, while this weldless chain of the same section, as shown by the test, breaks at over seven tons when made of iron and

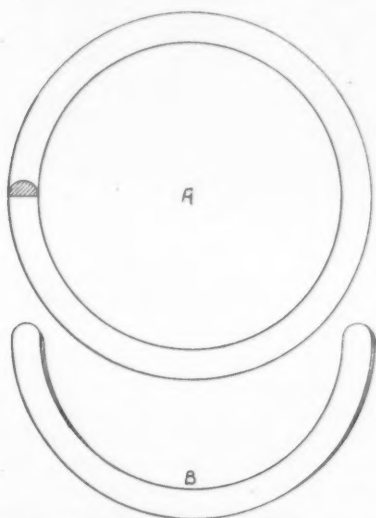


Fig. 5.—The Flat and Folded Appearance of a Connecting Link for the Weldless Joining of Two Pieces of Chain.

nine and a half tons when made of steel. According to English laws, only one-fifth of the breaking strain of a chain is allowed as a safe load; in other words, a factor of safety of five is required on account of the irregularity of the shape of the chain and the welding. A greater load may be allowed for the weldless chain because its links are of equal form and strength.

The weldless chain can be made in any size from the smallest size to the largest in commercial use. The chain is especially recommended for hoist and crane work. The same press may be used for making a number of different sizes of chain, depending, of course, upon the

power of the machine. On the press illustrated it is possible to make chains of any size up to $1\frac{1}{4}$ in. For different sizes of chain it is of course necessary to use corresponding dies. The best material for the weldless chain is iron which is not fibrous or a tough soft steel. In the $\frac{1}{2}$ -in. size each double link weighs about $6\frac{1}{2}$ oz., is about 3 in. long over all, and when formed into a chain each double link forms 2 in. in its length.

In the heating of the blanks a gas fire is for some reasons to be preferred to a coal or coke fire. The two machines employed in the manufacture of the $\frac{1}{2}$ -in. chain—that is, the screw press and the blank forming machine, together require about 6 to 7 hp. Two men can handle the work, one heating the iron blanks and the other operating the machine. No skilled help is necessary. Thirty seconds is required for making double links of any size, the links being heated to cherry red. At present the blanks are fed in by hand by the operator of the machine. The automatic machine which the inventor is now building will feed the blanks automatically.

A matter of importance to the success of the chain is the ability to repair it or join two pieces without using a welded link, for if the connection were welded the whole



Fig. 6.—The Weldless Joint Completed and Ready to Be Forged to Standard Link Form and Size.

chain would be little if any better than a welded chain. The weldless joint which has been contrived by the inventor is most ingenious. The joining link originally is an endless ring of half round section about $6\frac{3}{4}$ in. in diameter for $\frac{1}{2}$ -in. chain, and must of course be made by punching and forging from solid stock, so that it does not contain a weld.

This ring, shown at A in Fig. 5, is heated and folded over upon itself to form a half ring of full round $\frac{1}{2}$ -in. cross section as at B in Fig. 5. This half ring is then threaded through one of the links of the broken chain, and at one end of the folded section is opened sufficiently to insert and thread through the other end. By this means one eye is formed. The other end of the half ring is threaded through the eye of the other piece of chain, and is spread open to allow the first piece of chain to be passed through, and when drawn taut the second eye is formed and the two lengths of chain are joined together. The result is indicated in Fig. 6. Several heats may be necessary for the manipulation, and with a final heat the joint is forged to a form and size corresponding to the regular links of the chain.

An endless chain may be made without welding by opening the punched eye of the end of the chain on which it occurs and cutting through one side of each half round ring near its junction with the full round stock, the two cuts being on opposite sides from each other. The result will be hooks which can be opened up and threaded through the eye of the other end of the chain, and when the cut ends are closed down to their former position a fairly strong joint will be made, though of course not as strong as originally. If the chain is iron and not steel the integrity of the joint may be greatly improved by welding down the cut ends.

In repairing a chain which has been torn in breaking—that is, has suffered elongation before breaking, since the whole chain is weakened anyhow it is permissible to use a welded link as the connection between the broken parts, and the repaired chain may be used for lighter work than it was originally employed in. On the other hand, should a chain break—that is, rupture without elongation, and the remainder of the chain remain unweakened, the chain can be rejoined without welding in the manner described and is again as good as new.

The Ecseghy process of weldless chain making is employed by the Handelsgesellschaft Kleinberg & Co., Vienna, Austria, owners of the patents, and the American rights are in the hands of the International Import & Export Company, 1 Madison avenue, New York.

The New Franklin Air Compressors.

Being the manufacturer of pneumatic tools and appliances using compressed air as motive power the Chicago Pneumatic Tool Company, Chicago, is naturally interested in the most efficient means of compressing air, which accounts for its entering the field of compressor manufacture. Thereby it is enabled to offer complete equipment of its own make, covered by one guarantee and thus eliminate division of responsibility. The compressors are manufactured at a plant in Franklin, Pa., owned and operated by the company. While they are designed primarily for operating pneumatic tools there has been so wide a demand for them for all compressed air uses that the output of the plant has been taxed, requiring repeated extensions. Barring an occasional trade item little has appeared in the technical press concerning

provision is made for catching and draining drip from the bearings and stuffing boxes. Being entirely self-contained expensive foundations are avoided and expert erection services are unnecessary.

The cylinders are made from a mixture of iron and selected scrap, and are of sufficient strength and thickness after re boring to withstand the pressure for which they are designed. The steam cylinders are lagged with asbestos or mineral wool and planished iron. The air cylinders and cylinder heads are completely water jacketed, providing a thorough circulation of water with equal cooling at all points. The pistons are solid, with cast iron rings accurately fitted. The shaft is of center crank type, and made of open hearth steel, with exceptionally heavy crank arms.

The box cross head is provided with taper shoes, turned to fit the cylinder guides, and having screw ad-

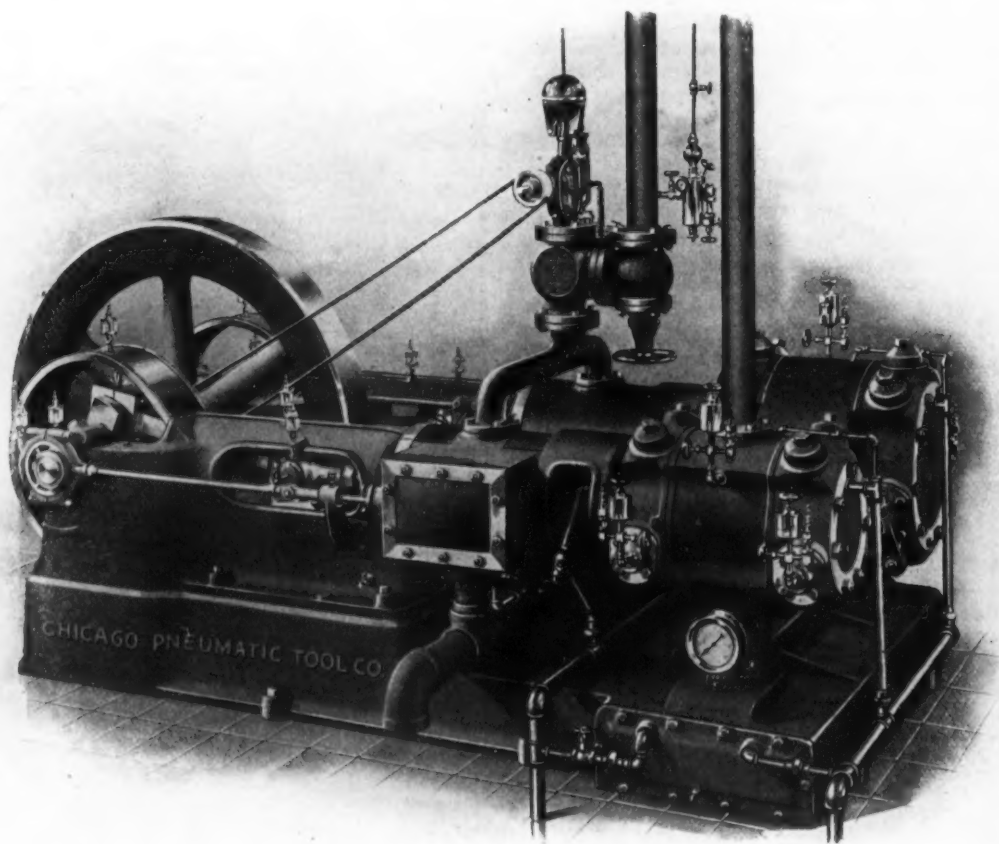


Fig. 1.—The Franklin Air Compressor, Type G-D S C, Built by the Chicago Pneumatic Tool Company.

the Franklin air compressors, and the accompanying illustration and description is one of the first ever published.

The machine in general follows standard practice, being the composite result of experience gathered from older designs and original efforts toward the obtaining of better efficiency. The compressor illustrated is especially suited to the requirements of industrial works, mines, quarries, &c. It is of duplex pattern, with simple or cross compound steam cylinders and simple or two-stage air compressing cylinders, according to working conditions. A variety of combinations is obtainable for varying pressure conditions, and machines are also built for motor and water wheel drive, either direct or by belt, gear or chain. These compressors are built in sizes ranging in capacity from 30 to 2000 cu. ft. of free air per minute displacement, for 10 to 125 lb. per square inch air pressure and suited to all compressed air uses.

The frames are heavy box frame, ribbed castings, with a full bottom bearing surface upon the foundations, affording an even distribution of strain upon the foundation and also of the internal stresses which the bed itself must sustain. The cross head guides are bored and

justments for taking up wear and preserving alignment. Oil guards at each end of the lower slide on the bed give continuous lubrication to the lower shoe, and a sight feed oil cup on top of the bed provides oil for the upper shoe. The piston rod is screwed into the cross head and secured by a lock nut. The connecting rod has a solid cross head end, with wedge and adjusting screws. The crank end is of marine type, with heavy bolts and brass liners. The single compressor has two balance wheels, one on each side to insure smooth operation. Duplex and cross compound compressors have one flywheel made in two sections bolted together.

Steam driven compressors are provided with a pressure regulating governor to automatically control the operation of the compressor in accordance with the demand for air, working in connection with a speed governor, which regulates the speed of the compressor. Single steam and belt driven compressors have an unloading device which causes the compressor to run idle when the desired air pressure is obtained, and automatically resume delivery when the receiver pressure falls. The smaller steam driven compressors have plain D-slide

valves. Steam cylinders 12 in. in diameter or larger are provided with the Meyer adjustable cut-off valves, the main valve being balanced. The balance plate and steam chest cover are sufficiently rigid to prevent their deflecting under steam pressure, which would impair the contact between the balance ring and the cover and cause leakage. A graduated scale indicates the point of cut-off, which may be adjusted from one-quarter to seven-eighths of the stroke, while the compressor is running. All valve rods, eccentric rods and links are of steel, with heads bushed with bronze and provided with take-up.

The air inlet valves are of poppet type, made from high grade steel, and have removable seats and guides, easily replaced or repaired, and protected from entering the cylinder in case of breakage. They are placed radially in the cylinder, rendering them readily accessible,

To meet the objections sometimes offered against a numerous complement of poppet valves, compressors of larger size are also built with mechanically moved intake valves of semirotary Corliss type, placed in the cylinder head and driven by gear from eccentrics on the main shaft. Figs. 1 and 2 show two views of a compressor so equipped. These positively moved valves combine large area with short ports and minimum clearances. They open and close without impact, and are therefore free from the hammering and wear incident to poppet valves. These valves are driven by separate eccentrics, which on duplex steam driven machines have the advantage of allowing adjustment of air valve gear without disturbing the setting of the steam valves. All bearings throughout the gear have phosphor bronze bushings adjustable for wear. The inlet as well as discharge valves can be re-

moved and inspected without disturbing the valve gear. All air discharge valves are of poppet type, cup shaped, pressed from high grade steel and fitted with light tension springs. These valves have removable seats and guides, and are readily accessible for adjustment or repair.

The intercooler, provided with two-stage compressors, forms part of the compressor base, being located directly under the air cylinders, minimizing piping and floor space and rendering the compressor with its intercooler entirely self-contained. The intercooler tubes are brass or charcoal iron expanded into steel tube sheets. Ribs are provided in the water heads and baffle plates are inserted between the tubes, insuring complete circulation of both water and air. By removing bolts in the outside head the entire set of tubes may be easily withdrawn for repairs or cleaning. Drains are provided for both the air and water spaces.

Sight feed lubricators are provided for the steam and air cylinders; wiper oilers for the crank pin bearings and oil cups for all wearing parts.

Before shipment every compressor is tested under working conditions. The testing floor consists of a series of 15-in. I-beams set upon solid foundations perfectly level and flush with the floor, insuring absolute accuracy of alignment, with facilities for testing compressors under the extreme load and maximum speed for which they are intended. All steam and air cylinders have indicator connections,

and indicator diagrams are taken under exact working conditions.

Franklin air compressors are especially designed for operating pneumatic chipping, calking, riveting and stone cutting hammers, drills, reamers, sand rammers, wood boring machines, flue cutters, painting machines, direct lift and air motor hoists, stone surfacing machines, and all classes of compressed air equipment in machine shops, boiler shops, railroad shops, shipyards, stoneyards and in bridge and building construction work; pumping natural or artificial gas, driving rock drills, coal cutters, pumps, locomotives, hoisting engines and other machinery in mines, tunnels and quarries; operating railway signals, testing and charging air brake equipments, sinking bridge caissons, displacing and agitating chemicals, pumping water by compressed air and for every other purpose for which compressed air is employed.

Since its organization about six months ago the Cement Machinery Mfg. Company, Columbus, Ohio, has taken over 12 cement machinery plants. Among its recent acquisitions are two plants at Waterloo, Iowa, and one in Pennsylvania.

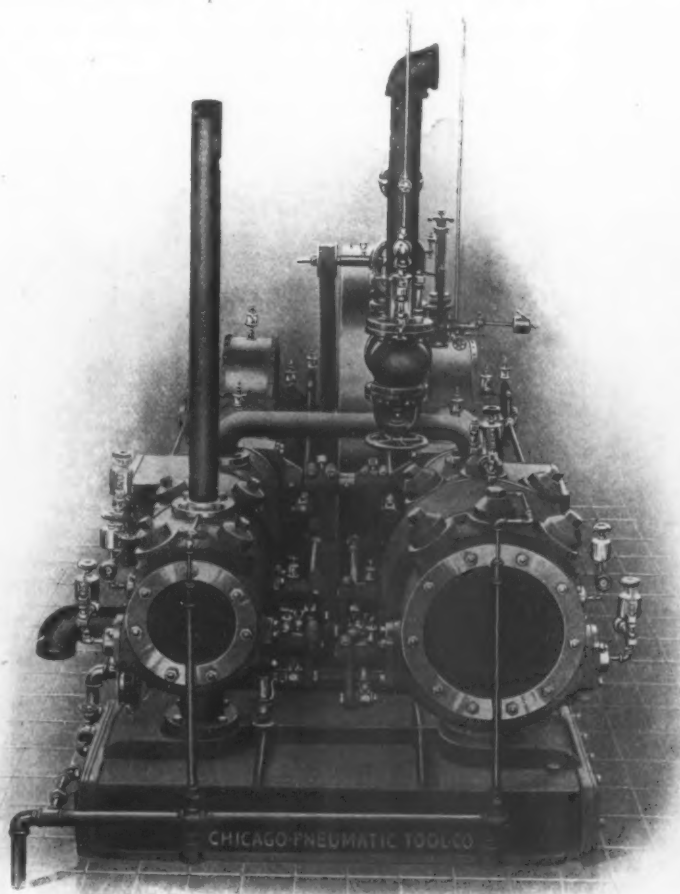


Fig. 2.—End View of the Same Compressor, Showing the Mechanically Moved Intake Valves.

insuring accurate seating and reducing wear. Too much importance cannot be attached to the feature of accessibility, for the valves are subject to severe service, and should the valves cease to perform their proper functions the compressor is either wholly or partially disabled until the trouble is remedied. The valve stem and head are forged in one piece, avoiding the use of flange nuts, jam nuts, split pins or other contrivances intended to serve as a head for the stem. The valve seat is separate from the cylinder proper and may be removed and replaced or renewed. The valve and seat form a complete piece of mechanism which may be examined, reground and adjusted separate from the compressor. The valves and seats are placed in position after the heads are attached to the cylinder, and are held securely by large screw plugs. As the heads need not be removed, it is but a moment's work to take out the valve. The valve springs are of steel, light enough to minimize resistance in opening, yet strong enough to promptly seat the valve in closing. The proportion of valve area is exceptionally liberal, enabling the cylinder to fill freely at each stroke without volumetric loss or impairing of efficiency due to wire drawing.

A Large Warren Pump and Condenser.

The twin beam vertical pump and condenser shown in the illustrations is one of a group of four which are being built by the Warren Steam Pump Company, Warren, Mass., for the Boston Elevated Railway Company, Boston, for installation in power plants, where they will each handle the condensation from engines of from 4200 to 4500 hp. The steam cylinders have a diameter of 18 in., the air barrels of 48 in. and the stroke is 24 in. Each is capable of condensing the steam from compound engines developing about 5000 hp.

The exhaust from the low pressure cylinder of the engine leads direct to the top of the condenser, which is at the rear of the view given in Fig. 1, through a 34-in. pipe. The buckets, bucket rods, air barrels and link

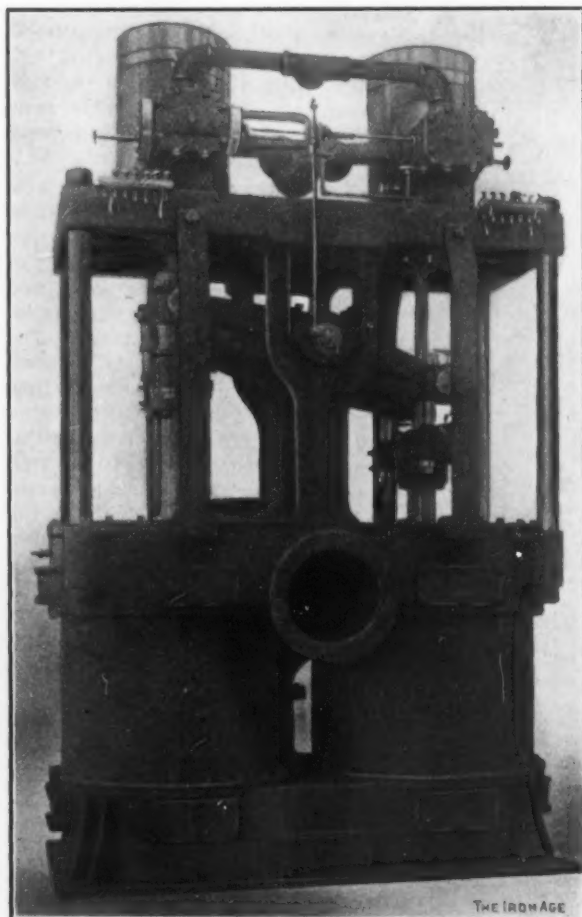


Fig. 1.—An Air Pump and Condenser of 5000 Hp. Capacity Built by the Warren Steam Pump Company, Warren, Mass.

boxes are of composition metal, the rod being reinforced through its center by a steel rod. The steel cylinders are lagged with nonconducting material held in place by Russia iron and brass bands. Metallic packing is used in the steam stuffing boxes. The cylinder heads are finished all over, adding to the appearance of the machine. The steam cylinder valves are actuated by steam pressure controlled through a lever connected with the walking beam. As will be seen in the line drawing, Fig. 2, the air piston, technically known as the bucket, is fitted with valves, as is also the bottom of the barrel, the bucket valves closing and the barrel valves opening on the upward or working stroke, and the bucket valves opening and the barrel valves closing during the idle stroke. As the two buckets work alternately the action of the pump is continuous. The weight of the machine is 27 tons.

The Sturtevant Engineering Company, 147 Queen Victoria street, London, the European representative of the B. F. Sturtevant Company, Boston, Mass., has just opened a new office at 2 Rue Lebeau, Brussels.

Furnace E of the Bethlehem Steel Company.

Mention has already been made of the blowing in on April 22, at South Bethlehem, Pa., of Furnace E of the Bethlehem Steel Company, construction work on which was begun in December, 1905. The height of the furnace is 90 ft., and the bosh diameter 22 ft. The usual skip hoist is in use, and one man attends to the operations connected with filling the furnace. Material is brought from the stockyards by an electric transfer car which will keep the storage bins supplying the furnace filled with raw materials, fuel and limestone. The five stoves are of the McClure type, 22 ft. in diameter and 100 ft. high. The gases are thoroughly cleansed by dust catchers and washers.

The blowing equipment consists of three horizontal vertical engines built by the Southwark Foundry & Machine Company, Philadelphia. They have a speed of 60

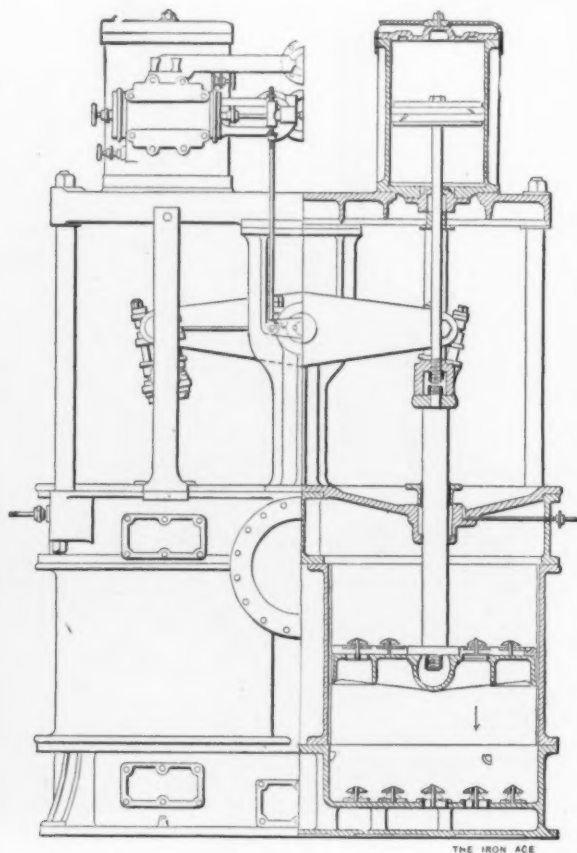


Fig. 2.—The Warren Twin Beam Vertical Air Pump and Condenser in Elevation and Partly in Section, Showing the Valves of the Air Buckets.

rev. per min., and are capable of blowing 50,000 cu. ft. of air per minute. The metal is tapped into unusually large ladles, having 35 tons capacity each, which will transport it to the new steel plant.

The old furnaces are also being supplied with raw material bins, which will be filled in the same economical way followed at Furnace E. These improvements will be completed in the course of a few months. An extensive ore handling device for loading and unloading material is about completed as well as stockyards for taking care of 1,500,000 tons of raw material, which will supply the entire blast furnace plant.

The Bethlehem Steel Company has in contemplation the erection later of three additional blast furnaces of the same type as Furnace E, which will take the place of the four old furnaces now in operation. Any one of the three horizontal vertical blowing engines already installed is capable of furnishing the blast for a furnace of the same type as the new one. The bin system is capable of supplying the new furnace as well as the four original furnaces, and it will supply the plant after the old furnaces have been replaced by new ones.

The Fortuna Electric Breast Drill.

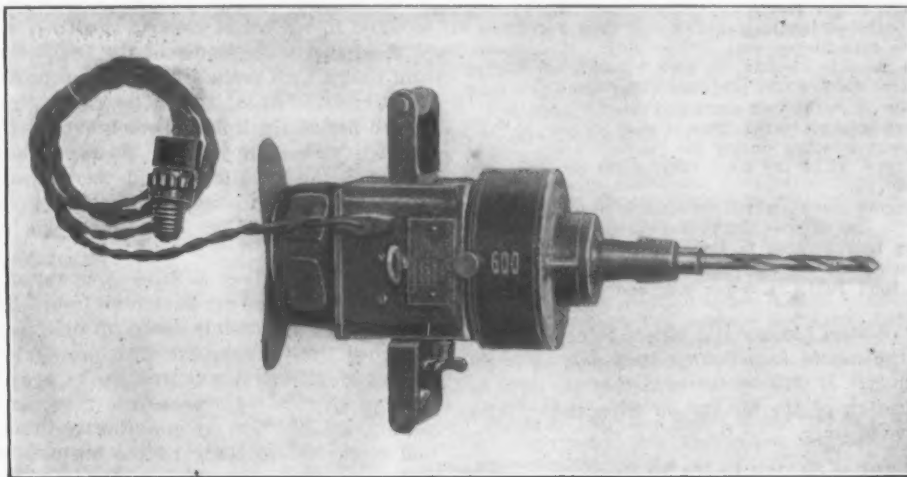
A portable electric breast drill of new design, capable of three changes of speed, which can be made instantly while the machine is running, has been brought out by the Fortuna Machine Company, 127 Duane street, New York. The machine, which is shown in the accompanying illustration, is equally adaptable for drilling, reaming and tapping.

The changing of speed while the drill is in operation is accomplished by differential gears inclosed in the head of the drill. A snap lock is provided, which, when released by pressure against a pin projecting against the head of the drill, allows the entire front portion to be turned around to points where the respective speeds are marked. This speed feature renders the drill particularly adaptable to reaming and tapping, as well as drilling, and for the purpose of tapping the machine is made reversible. A special starting, stopping and reversing switch is provided, which can be turned on and off by the operator while having his hand on the handle. The drills are fitted with ball bearings, and wherever possible aluminum has been used in the construction to minimize weight without reducing the efficiency. The motor is designed to permit an overload beyond the rated capacity. When

The C. I. F. Company.

To represent American manufacturers abroad in a way entirely different from that of a dealer or agent or any of the present export houses is the purpose of the C. I. F. Company, recently organized in New York. Its functions will include the handling of business, so that the manufacturer will be relieved of all responsibility beyond delivering the goods to the shipping port. It will quote the prices on the C. I. F. (cost, insurance and freight) basis, and attend to advertising, creating a demand for goods, financing and bringing in orders and delivering the goods to the consumer.

Among the more important details in the scheme are the following: The company will deliver to at least 500 foreign dealers complete sets of catalogues and other printed matter from each manufacturer represented, and with them special price-lists based on delivery in each dealer's territory on the C. I. F. basis. At least twice annually the company will issue a periodical index containing a comprehensive list covering the goods made by the manufacturers represented and distribute this to at least 25,000 buyers in foreign countries. The catalogues furnished the dealers will be given an individual number and letter, and will be indexed alphabetically by subject



The Portable Electric Breast Drill of the Fortuna Machine Company, New York.

necessary to support the drill by an "old man" a feed wheel and spindle can be attached in place of the breast plate.

The drill is offered in three sizes for drilling holes in steel and iron up to 9-16, $\frac{7}{8}$ and 1 $\frac{3}{8}$ in., respectively. The speeds of the smallest size are 600, 350 and 200 rev. per min.; of the middle size, 500, 260 and 160 rev. per min., and of the largest size, 440, 210 and 120 rev. per min. The drills are furnished for direct and alternating current. At present the company is importing the manufactured product, which is of German design, but it expects later to make the drills in this country, having secured the American rights to the patents.

Ozone is used for purifying water in a plant recently installed at Saint-Maur, near Paris, France. The water is taken from the River Marne, and is usually clarified by deposition or filtering through sand. It is then driven through a sterilizer at a uniform rate of flow, in which air, after being impregnated with ozone, is brought in contact with it. The ozone is generated on the Frise system, the electrified air being cooled to below 25 degrees C. (77 degrees F.), which is said to be the temperature most favorable for ozone production. The electric current supply is furnished by an alternator and transformers designed to deliver current at 40,000 volts. The 45-hp. engine which drives the generator also runs the 33,000-gal. centrifugal pump handling the water. The results of the process are said to have been very satisfactory, the power consumption involved in handling 22,000 gal. of water per hour having been only 4.8 hp.

matter contained and by manufacturers' names. The periodical index which will be issued to consumers covers by classification everything conceivable that may be needed in the way of machinery, apparatus and supplies, and may perhaps appropriately be called an analytical specification. It is very comprehensive and ramifies from broad general classifications through various sub-heads and minor divisions to the last analysis which gives the specific articles of equipment. These are indexed alphabetically, in connection with the names of the manufacturers supplying them. By the use of this index the consumer will be assisted in the selection of the machinery and apparatus he requires, and will then be in a position to communicate with the nearest dealer and obtain quotations on the delivered goods and any other information he may need.

The scheme is one that has been conceived by Alexander M. Fisher of New York City, an engineer of extensive experience in the selling of machinery abroad, who during the past five years has devoted a great amount of time to perfecting the details of this export selling system. The C. I. F. Company, of which Mr. Fisher is president, has its office at 32 Broadway, New York City.

A reference room for architects, in which samples of their products may be shown, has been opened at 1115 Schofield Building, Cleveland, Ohio, by the Berger Mfg. Company, Canton, Ohio; the Pressed Radiator Company, Pittsburgh, Pa.; J. M. & L. A. Osborn, Cleveland, and the Union Fabric Company, Winona, Minn. C. D. Palmer is in charge.

Iron and Steel Bounties in Canada.

TORONTO, May 4, 1907.—Parliament has reached the end of the long session which began in November. One item of business that was introduced early in the session, but was not finally disposed of until last week, was the plan for continuing the bounties on iron and steel. The bounty resolutions were passed by the House April 23, and on that day a bill embodying them received its third reading. The bill went through the Senate without event and is now law. The bounties are now as follows:

a. In respect of pig iron manufactured from ore, on the proportion from Canadian ore produced during the calendar years—1907, \$2.10 per ton; 1908, \$2.10 per ton; 1909, \$1.70 per ton, and 1910, 90 cents per ton.

b. In respect of pig iron manufactured from ore, on the proportion from foreign ore produced the calendar years—1907, \$1.10 per ton; 1908, \$1.10 per ton; 1909, 70 cents per ton, and 1910, 40 cents per ton.

c. On puddled iron bars manufactured from pig iron made in Canada during the calendar years—1907, \$1.65 per ton; 1908, \$1.65 per ton; 1909, \$1.05 per ton, and 1910, 60 cents per ton.

d. In respect of rolled, round wire rods not over $\frac{3}{8}$ in. in diameter, manufactured in Canada from steel produced in Canada from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada, when sold to wire manufacturers for use or when used in making wire in their own factories in Canada, on such wire rods made after December 31, 1906, \$6 per ton.

e. In respect of steel ingots manufactured from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada, on such ingots made during the calendar years—1907, \$1.65 per ton; 1908, \$1.65 per ton; 1909, \$1.05 per ton, and 1910, 60 cents per ton.

f. On pig iron manufactured from Canadian ore by the process of electricity smelting during the calendar years—1909, \$2.10 per ton; 1910, \$2.10 per ton; 1911, \$1.70 per ton, and 1912, 90 cents per ton.

g. On steel ingots manufactured by electric process directly from Canadian ore, and on steel ingots manufactured by electric process from pig iron smelted in Canada by electricity from Canadian ore during the calendar years—1909, \$1.65 per ton; 1910, \$1.65 per ton; 1911, \$1.05 per ton, and 1912, 60 cents per ton.

In the case of steel blooms and billets being exported from Canada the ingots from which they are made do not earn a bounty. It will be observed that no limit is put on the duration of the bounty on wire rods. Also they remain free of duty.

The Bounties Shown to Be No Burden.

The Minister insisted that the bounties were not really an added burden, for the industries they fostered were the means of greatly enhancing the trade of the points at which they are situated, and thereby swelling the Government's revenue in the form of customs duties. He pointed out that at the seven centers of Canadian iron and steel production—Sydney, North Sydney and Londonderry in Nova Scotia; Deseronto, Hamilton, Midland and Sault Ste. Marie, in Ontario—the customs receipts in the past nine years amounted to \$11,785,000; whereas in the nine years immediately before that they amounted to only \$4,638,000. As \$7,948,000 has been paid out in the last nine years, the Minister argued that \$4,638,000 is already paid back, that being the increase in the customs duties at the seven iron centers in the later nine-year period. This he credits to the iron and steel industries nourished by the bounties.

Holding these views as to the moderateness of the protection afforded by the bounties and as to their effect to develop revenue, the Finance Minister said he could not but feel that the numerous signers of petitions against the bounties must have been under a misapprehension as to the burden of this mode of encouraging the iron and steel industries. He stated that the ore used at Sydney was almost entirely of Newfoundland origin, while that used at Sault Ste. Marie was partly from domestic and partly from United States mines. In 1905-06, he said, the Algoma Steel Company turned out 222,891 tons of steel, the ingredients of which were 180,472 tons of Canadian pig iron, 21,219 tons of foreign pig iron and 46,820 tons of other elements. As to the quantities of Canadian and American ore, respectively, used in the production of the Canadian made pig iron, he gave no information. The Minister promised one of the

members of the Opposition that a return would be brought down showing the percentage of Canadian ore used.

Electric Smelting.

Dealing with the provisions for the encouragement of electric smelting, Mr. Fielding alluded to the successful experiments carried on at Sault Ste. Marie, and pointed out that by this system it was hoped that it would be possible to treat ores which were not commercially valuable, especially Ontario ores, when submitted to the older methods of smelting. The amount of bounties was exactly the same, but the period over which they were extended had been put forward two years. The reason for that was because it had been represented that it would take at least two years to bring these electric plants into operation. The value of electric smelting had been pointed out by a well-known Swedish authority, who had stated that by its aid it was possible that Canada would drive Swedish iron out of the markets of the United States, Great Britain and Japan. In conclusion, Mr. Fielding said that the estimated cost of the bounties had been generally exaggerated. Taking last year's production as a basis, and adding 10 per cent. increase each year, the statement that the bounties would amount to varying sums ranging from \$18,000,000 to \$25,000,000 were greatly exaggerated. He considered a more correct estimate would be \$7,500,000, and a further sum of \$500,000 in respect of electric smelting.

Replying to the leader of the Opposition, the Minister said that a high grade iron had been produced by electric smelting. He added that after the expiration of the extended period the iron and steel manufacturing industries ought to be self-supporting. So far as it is now possible to judge, the bounties should then cease. The Government, he said, had been approached by capitalists who proposed to establish an electric smelting plant near Niagara Falls.

The Niagara Iron & Steel Company, for whose incorporation letters patent have been issued by the Dominion Government, is possibly made up of the parties who approached the Government with proposals for the establishing of electrical smelting works near Niagara Falls. The company's charter gives it varied and extensive powers, among them being authority to manufacture iron and steel, and to carry on the business of rolling mills and the manufacture of iron and steel rails, muck bar, refined rolled bar and Bessemer and all other descriptions of steel. As the right to develop and apply electricity is also conceded, the presumption is that the company proposes to do its smelting and converting by electricity. Senator Kerr of Toronto is one of the incorporators. Toronto is to be the company's chief place of business. The capital is limited to \$1,000,000.

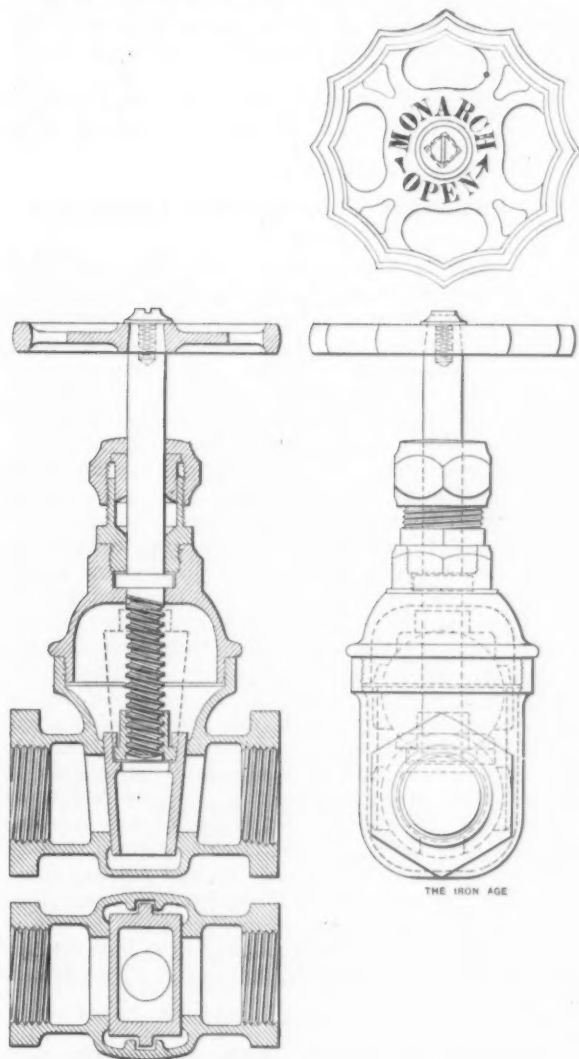
C. A. C. J.

Business Opportunities.—The industrial department of the Rock Island-Frisco Lines has issued a 160-page book called "Opportunities," which is designed to be of service to any manufacturer or business man in search of another location. The book contains a concise description of each town and city along the 13,500 miles of railroad embraced in the Rock Island, Frisco and Chicago & Eastern Illinois railroads, and in parallel columns on the same page with the description of the community is given a list of the existing openings for business houses, factories, mills and industries of all kinds. Many new towns and cities have sprung into life along the large number of newly constructed lines of the Rock Island-Frisco, and particularly in these communities numerous promising openings exist. Any founder, ironworker or manufacturer of machinery interested in changing his location can secure a copy by addressing M. Schuller, industrial commissioner, Rock Island-Frisco Lines, St. Louis, Mo.

Indications are that the current fiscal year will close on June 30 with a surplus in the National Treasury exceeding \$70,000,000. The estimate for the year, made by the Secretary of the Treasury last December, was \$58,000,000, but the receipts have surpassed all expectations.

The Monarch Gate Valve.

The gate valve shown in the illustration is of new design, being the standard type which a new company, the Monarch Valve & Mfg. Company, Warren, Mass., is putting on the market. A tapered wedge plug is used, made so that it is reversible, entering its seat either way. A driving gland packing box is employed, a feature of which is its quick accessibility. The handle is easily removed by means of the screw at the end of the stem.



Details of the Standard Gate Valve Made by the Monarch Valve & Mfg. Company, Warren, Mass.

and the gland collar is notched to permit of the use of a spanner wrench. The handle wheel is designed to give a strong grip for the hand.

Mutual fire insurance was the subject of discussion at the meeting of the Boston branch of the National Metal Trades Association, at the Parker House, Boston, on the evening of May 1. The speakers were J. P. Gray of the Boston Manufacturers' Mutual Fire Insurance Company, and E. E. Perry, Indianapolis, secretary of the Metal Manufacturers' Mutual Fire Insurance Company. A large attendance enjoyed a profitable evening, as well as the customary dinner. President Fred F. Stockwell was in the chair. The Stark Tool Company, Waltham, Mass., and Dalrymple & Brissette, Boston, were admitted to membership in the association.

The per capita circulation of money in the United States on May 1 established a new high record mark, reaching \$34.16. The highest point previously attained was on February 1 last, when it was \$33.96. The per capita at this date last year was \$32.22. The present population of the country, which is used as the basis in calculating the per capita, is estimated at 85,838,000.

The Philadelphia Foundrymen's Association.

A particularly large attendance of foundrymen, both local and from out of the city, graced the regular monthly meeting of the Philadelphia Foundrymen's Association, held at the Manufacturers' Club in that city on the evening of May 1. The approaching American Foundrymen's Association convention was no doubt responsible to a certain degree, but from the number of brass foundrymen present it was evident that a large share of the interest was due to the paper on the subject of "Brass Melting Furnaces," which was to be read by J. H. Sheeler of the Sheeler-Hemsher Company, Philadelphia.

The meeting was called to order at the usual hour by President Devlin. The Nelson Valve Company, W. J. Spencer, representative, Wyndemore, Pa., and Charles James, general manager of the Sterlingworth Railway Supply Company, Easton, Pa., were elected to membership in the association. The treasurer's report showed a balance of over \$2500 on hand, with all bills paid. A contribution of \$200 was received from the Philadelphia Foundry Foremen toward defraying the expenses of the entertainment of those attending the coming American Foundrymen's Association, while \$500 was voted as a contribution from the Philadelphia Foundrymen's Association for the same purpose. The remainder of the fund is being raised by subscriptions from firms and individuals.

Chairman E. E. Brown of the Entertainment Committee reported that the work of the committee was progressing very satisfactorily. A provisional programme had been made after conferring with the officers of the American Foundrymen's Association, which is as follows:

Monday, May 20.—Registration begins at the Second Regiment Armory, Broad and Diamond streets, where the convention exhibits of the Foundry Supply Association will be formally opened and continue until Friday evening, May 24. The Associated Foundry Foremen meet at the Manufacturers' Club in the evening.

Tuesday, May 21.—The opening session of the American Foundrymen's Association will be held in the Armory at 10 a.m. Mayor Reyburn will welcome the association, while addresses will be made by the officers and reports of the various committees of the association will be received.

At 2 p.m. a business session of the association follows, while in the evening a smoker will be given at Lu Lu Temple to the members and guests of the various associations.

Wednesday, May 22.—10 a.m. a meeting will be held for the formal organization of an association composed of brass founders and allied trades.

At 2 p.m. business session of the American Foundrymen's Association.

Thursday, May 23.—River trip and shad dinner at Washington Park.

Friday, May 24.—Optional trips to plants of the Link-Belt Company, Niles-Bement-Pond Company, Camden Iron Works, J. W. Paxson Company, Warwick Iron & Steel Company, University of Pennsylvania, steel casting and malleable iron plants, brass foundries, and a number of other industrial plants not yet definitely decided upon.

The exhibition of the Foundry Supply Association will be open continuously during the week, and free admittance may be had by any one interested in the trade.

The Entertainment Committee of the Philadelphia Foundrymen's Association will have headquarters at both the Armory and the Bellevue-Stratford Hotel. At the hotel a bureau of information will be maintained, where those visiting the convention may obtain information on any subject pertaining to the convention and entertainments.

During the convention week the visiting ladies will be looked after by a special committee of local ladies. Visits will be made to the exhibition at the Armory. A theatre party is being planned, as are also trips through Fairmount Park and to many points of historical interest about the city. On Thursday the ladies will be given an excursion to Atlantic City. This trip is also an optional one for the gentlemen, who may elect to go either to Atlantic City or to the Washington Park shad dinner. A ladies' bureau of information will be established at the Bellevue-Stratford Hotel, where information pertaining to the convention entertainments, &c., may be had.

President Devlin also announced that the malleable iron manufacturers from all sections of the country would meet in this city during the convention week, and would,

as his guests, attend the shad dinner and river trip to be given the visiting associations.

The paper by J. H. Sheeler, to which reference is made above, was received with a great deal of interest, and in the discussion which followed details as to method of handling the furnace, loss by oxidation and other points were brought out. Mr. Sheeler was tendered a vote of thanks, after which the meeting adjourned.

The Foundrymen's Convention at Philadelphia.

The secretary, Dr. Richard Moldenke, has announced tentatively the programme for the convention of the American Foundrymen's Association, which will be held in Philadelphia, May 21, 22 and 23. A list of about 30 papers and addresses has already been made up. The exhibit of the foundry supply firms under the auspices of the Foundry Supply Association will be opened in the Second Regiment Armory on Monday morning, May 20, when registration for the convention begins. The opening session will be held on Tuesday morning, and the Mayor of Philadelphia will make an address of welcome. Reports of the president, secretary, treasurer of the association and of various committees will also be submitted. The afternoon session will be devoted to papers, and the evening is left open for entertainment.

Brass foundry interests will have the floor on Wednesday morning, when the Brass Founders' Association which has been projected for some months will be organized. Wednesday afternoon will be given up to papers accompanied by lantern slides, and a smoker will be given by the Philadelphia Foundrymen's Association in the evening. The greater part of Thursday will be taken up with a river trip and a shad dinner, and visits have been planned to the Cramp shipyards and to other points of interest. The closing session will either be held on the boat returning from the day's excursion or in the hall after returning. The list of papers thus far announced is as follows:

- "The Carnegie Technical School Foundry," by Director Hammerschlag, Pittsburgh, Pa.
- "The Training in Foundry Work at Pratt Institute," by Prof. W. C. Stimpson, Brooklyn, N. Y.
- "Industrial Foundry Education," by Herbert E. Field, Pittsburgh, Pa.
- "Some Facts Concerning Trade Schools," by W. E. McCarter, Marietta, Ga.
- "Twenty Years' Improvement in the Brass Foundry," an address by Chas. J. Caley, New Britain, Conn.
- "The Use of Heated Mixers in the Foundry," by J. B. Nau, New York City.
- "Comparative Cupola Practice," by W. S. McQuillan, South Norwalk, Conn.
- "Cost Accounts," by H. F. J. Porter, New York.
- "Copper in Cast Iron," by W. M. Saunders, Providence, R. I.
- "Sound, Clean Castings," by David Spence, Franklin, Mass.
- "The Layout and Construction of Foundry Buildings," by Geo. K. Hooper, New York.
- "Industrial Betterment," an address by H. F. J. Porter, New York.
- "Some Points in the Corerom Which Are Not Considered," by Geo. H. Wadsworth, Cuyahoga Falls, Ohio.
- "Foundry Design and Construction," by F. A. Coleman, Cleveland, Ohio.
- "The Gray Iron Foundry as a Business Venture," by Thos. D. West, Sharpsville, Pa.
- "The Steel Foundry as a Business Venture," by W. M. Carr, New York.
- "The Malleable Foundry as a Business Venture," by R. Moldenke, Watchung, N. J.
- "The Evolution of the Foundry Business," by Edward B. Gilmour, Elizabethtown, Pa.
- "Modern Blast Furnace Practice," an address by President Edgar S. Cook, Warwick Iron & Steel Company, Pottstown, Pa.
- "Cast Thread Fittings," by Henry B. Cutter, Seneca Falls, N. Y.
- "The Supply of Skilled Labor for the Development of Our American Industries," an address by Vice-President M. W. Alexander, American Society for Industrial Education, Lynn, Mass.
- "The Universal System of Molding Machines," by E. Ronceray, Paris, France.
- "A New Method of Preparing Molding Sand," by E. Ronceray, Paris, France.
- "Shop Kinks, Short Cuts and Don'ts," by the Cleveland Pattern Foremen's Association.
- "Manganese in Cast Iron," by Herbert E. Field, Pittsburgh, Pa.
- "A Few Denatured Brass Foundry Notes," by W. H. Parry, Brooklyn, N. Y.

"Uniform Cost Accounts for Jobbing Foundries," as recommended to the Jobbing Founders' Association by the Cost Committee of that Association.

"Dry Galvanizing," by Alfred Sang, Pittsburgh, Pa.

"Cupola Linings," by A. F. Spencer, Pittsburgh, Pa.

"Standard Methods for Analysis of Cast Iron," by H. E. Diller, Chicago, Ill.

"A Plea for the Apprentice," by W. W. Gebb, Jerome, A. T.

"Notes on Bronze Founding," by C. E. Johnson, Dorchester, Mass.

"Nickel in Cast Iron," by Jas. F. Webb, Elkhart, Ind.

"Design for a Modern Pipe Foundry," by J. B. Nau, New York

"The Induction Furnace."

In addition to the above a number of papers of special interest to brass founders will be presented in connection with the meeting for the formation of the Brass Founders' Association. Thus far allotments of space in the Foundry Supply Association's exhibit have been made to 60 firms. The association now has an enrollment of 80 members.

The Pittsburgh Foundrymen's Association.

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the Colonial Annex Hotel, Pittsburgh, on the evening of May 6, the meeting being preceded by a dinner. H. P. Spilker was in the chair and F. H. Zimmers was secretary. Mr. Zimmers made a motion, which was unanimously carried, that Dr. Richard Moldenke, secretary of the American Foundrymen's Association, be made a life member of the Pittsburgh Foundrymen's Association. Dr. Moldenke was present at the meeting, and in an address outlined what was expected to be done at the meeting of the American Foundrymen's Association to be held in Philadelphia, May 21 to 24. S. T. Johnston, president of the American Foundry Supply Association, made an address in which he stated that his association has gone to considerable trouble and expense to make the convention and exhibits both interesting and instructive, and feels that every one who attends the meeting will be amply repaid. H. M. Lane, secretary of the American Foundry Supply Association, called attention to the remarkable growth of that organization. He said that of the exhibits to be shown at Philadelphia 12 separate firms would have molding machines in full operation, and the distinct advantages of each machine would be pointed out. Core machines would also be shown on a more extensive scale than at previous meetings. A motion was made and adopted that a committee be appointed to take charge of arranging for the trip of the Pittsburgh Foundrymen's Association to Philadelphia. This committee consists of H. E. Field, J. S. McCormick and F. H. Zimmers.

Pneumatic vs. Electric Drills.—Comparisons have been made between pneumatic and electric drills which seem to favor the former. The particular advantages claimed for the electric drill are low first cost of plant and ease of installation and great economy of power. Offsetting these items, says the *Engineering and Mining Journal*, are high cost of maintenance and much time lost on account of breakdowns. The main difficulty with the electric drill seems to be weakness in insulation, no form having yet been devised which will long stand up under the continued jar of the drill body. With the motor removed from the drill body this difficulty is overcome, but here trouble is encountered with the connecting mechanism. Drilling holes in rock is an operation in which an exhibition of bull strength and endurance is desirable, and this feature the air drill possesses to a remarkable degree. All of the parts of the reciprocating piston that are liable to damage are easily protected from mechanical injury, and are so inclosed in a chamber of elastic and compressible gas that no damage results, even when sticking occurs. In a test air drills in use 317 hr. drilled 4 ft. per hour, with no loss of time for repairs; electric drills operated 100 hr., with 17 hr. lost for repairs, and averaged 2½ ft. per hour.

The Italian Government has placed an order for 4000 tons of steel rails with the Donetz plant of Russia, which recently secured a contract in Argentina.

The Sheeler-Hemsher Improved Crucible Furnace.*

The development of the Sheeler-Hemsher furnace for melting brass and other metals was entirely due to the force of necessity, the mother of invention. In regular practice we had been using in our foundry furnaces of the natural draft type, having an 80-ft. stack, 3 ft. in diameter. The stack should have given enough draft and did at times, but right here is where the difficulty was experienced, the draft could not be depended upon and heats were in some cases delayed for hours, which any one will admit is a first-class means of eating up profits. We found a loss in oxidation as high as 7 per cent. on red metal alone, and at times it was necessary to have our furnacemen begin as early as 5.30 in the morning in order to have the metal ready for the first pouring.

A Forced Draft Furnace Decided Upon.

Considerable thought was given to the development of a furnace which could be depended upon and which would be as simple as possible, one without complicated mechanical features and one that could be built at a minimum cost, with low fuel expense, and a reduction in the loss by oxidation. The result was the Sheeler-Hemsher forced draft crucible furnace, using a combination of coal and coke for fuel. This type of furnace has been in successful operation in our own foundry, as well as in a number of other foundries, for several years. In this furnace a number of the old natural draft furnace principles have been retained, while a number of new features have been added, and we have a furnace without any unnecessary mechanical accessories which often look well and argue well, but fail to produce the desired result.

The reduction of fuel costs, the saving of time in melting and the low percentage of loss by oxidation have been proved by actual practice. The contention of many that black lead crucibles suffer greatly under forced draft does not seem to be borne out by our experience with this furnace. In fact, we have been able to get almost regularly from 30 to 35 heats each from several of the leading makes of crucibles.

Description of the Furnace.

The Sheeler-Hemsher furnace can be built to accommodate any size of crucible. Those in general service take in a No. 70 without difficulty. This size furnace measures approximately 27 in. in height and consists of two $\frac{3}{8}$ -in. boiler iron shells, 18 and 9 in. in height, respectively, and 26 in. in diameter, bolted together, making two sections and lined with fire brick stood on end. The upper section is made so that it can readily be removed from the lower one by a tee iron connection, that serves to hold the fire brick lining of the shell in position, as well as forming a guide and clamp to hold the lower section in position, which rests directly on the ash pit or air chamber. The advantage gained in making this furnace in two sections is that it permits of repairs to either the upper or lower sections independently, without the necessity of relining the entire furnace. The ability to do this as often as the lining of the lower or firebox section cuts out to any appreciable degree is not only the matter of reducing the costs of repairs, but in that it enables the operator to reduce the area of the firebox, due to the cutting of the lining, and thus the consumption of an excessive amount of fuel, due to the increased size of the firebox, is avoided. This makes quite an important saving in the item of fuel expense, as it has been demonstrated from actual experience that the lining of the upper section of the furnace will last about four times as long as the lower one. The saving in repair work, by lining one section at a time, is, therefore, obvious.

The ash pit or air chamber of the furnace is rectangular in shape, 39 in. long, 27 in. wide and 12 in. deep, with the usual door for cleaning out the ashes, &c., mudded up in the regular manner when the furnace is in operation. The top of the ash pit consists of a cast iron plate, with a raised rim,

which holds the furnace in position. The firebox extends about 8 in. in front of the furnace, and the inlet of the blast into the firebox is through a 3-in. pipe, located in the upper portion of this extended section, the air blowing directly downward into the pit. The grate bars are 1 in. square and are carried in a sling just under the firebox. The furnace tops or covers are cast iron and semicircular in shape, made in two sections, with an opening in the center, 11 in. in diameter, in order to hold a worn out crucible, with the bottom removed, so as to act as a funnel in charging. When the funnel is not in use it is covered in turn by a small separate cast iron cover that can be easily shifted and allow the melter to get at the pot for stirring, &c., without removing the entire cover.

Pressure of the Blast Used.

The blast used in connection with a Sheeler-Hemsher furnace should be at a pressure of from 1 to $1\frac{1}{2}$ oz. In our foundry, where a battery of eight furnaces is installed, the pressure is supplied by a No. $\frac{1}{2}$ Baker pressure blower, giving 13 oz. pressure when all the gates are closed. A 6-in. blast main carries the air to the furnaces and the average pressure per furnace is about 1 oz.

Some records as to the working and fuel cost on these furnaces made in our own plant are as follows:

Recently 200 lb. of copper in the shape of sheet clippings and chunks was run down and poured into castings in 60 min. A No. 70 crucible was used, and the fuel consisted of 36 lb. of coal and 46 lb. of coke, the fuel cost per 100 lb. of metal being 11 cents.

Again, 180 lb. of bronze scrap was run down ready for pouring in 45 min., the fuel consumption being 24 lb. of coal and 24 lb. of coke, the cost for fuel being 81-3 cents per 100 lb. of metal.

Again, 180 lb. of yellow brass punchings was melted ready for pouring in 35 min., using 20 lb. of coal and 24 lb. of coke, or a cost of 62-3 cents per 100 lb. of metal.

As an experiment 180 lb. of pig iron, broken in small pieces, was run down in this furnace in $1\frac{1}{4}$ hr., pouring a clean and perfect casting. No fuel account was kept against this heat, as it was not done to test the question of economy, but the ability of the furnace to develop the necessary heat to melt the charge in a reasonable time.

In all the above tests the loss of metal by oxidation was extremely low. In three separate tests in running down red brass turnings or chips the loss in each case was $1\frac{1}{2}$ per cent. In running down copper ingot we were unable to determine any loss. In running down copper gates and wire the loss was 10 oz. to the 100 lb., and part of this was no doubt sand that adhered to the gates. With 100 lb. of yellow brass ingot, gates, &c., run down in 40 min., the loss was $\frac{3}{4}$ lb. of metal, using 24 lb. of coke and 20 lb. of coal.

New Ore Unloaders at Lake Erie Ports.—The opening of the season of navigation finds the lower lake docks much better equipped for the handling of iron ore cargoes than in previous seasons. Since the close of navigation last year 13 electrical unloading plants have been erected at Lake Erie ports by the Brown Hoisting Machinery Company, Cleveland, Ohio. Six of these fast plants have been built for the Pennsylvania & Lake Erie Dock Company, at Fairport, Ohio, four for the N. Y., P. & O. Dock Company, Cleveland, which is controlled by Pickands, Mather & Co., and three at Buffalo for the New York Central & Hudson River Railroad. The new plants are already in operation at Fairport, and those in Cleveland will be ready for operation in a few days. The Buffalo unloaders will not be completed for several weeks. Each machine is equipped with a 5-ton ore bucket.

The Dunlap-Connellsville Coke Company has been organized at Connellsville, Pa., with a capital stock of \$500,000, to develop 150 acres of coking coal lands in the Connellsville region. The company will build a number of ovens. William A. Bishop, Connellsville, is president; Paul Mauzy, Brownsville, vice-president; George W. Campbell, Connellsville, secretary; James W. Buttermore, Connellsville, treasurer.

* Paper read by J. H. Sheeler of the Sheeler-Hemsher Company, Philadelphia, before the Philadelphia Foundrymen's Association, May 1.

THE IRON AGE

1855-1907.

New York, Thursday, May 9, 1907.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY,	.	.	.	.	.	.	.	.	.	PUBLISHER
CHARLES KIRCHHOFF,	.	.	.	.	.	.	.	.	.	} EDITORS
GEO. W. COPE,	.	.	.	.	.	.	.	.	.
A. I. FINDLEY,	.	.	.	.	.	.	.	.	.
RICHARD R. WILLIAMS,	.	.	.	.	.	.	.	.	.	HARDWARE EDITOR

A Quiet Labor Situation.

The absence of strikes is a feature of the industrial situation in the spring of 1907 that contrasts agreeably with a number of other years. By itself this condition does not signify greatly as to the continuance of the present scale of prosperity, for strikes have come with the tide of business at its flood; they have likewise accompanied trade shrinkage and falling values. In no industry has there been any attempt to reduce wages this year, but the possibility of such attempts coming later has prompted an advance proclamation from President Gompers of the American Federation of Labor. He sends word down the lines that union labor must stand everywhere against any reductions in wages that may grow out of the prevailing agitation concerning the future of business.

In the spring of 1906, in contrast with to-day, the threat of labor troubles colored all estimates of the industrial outlook. The anthracite operators and workers, after weeks of skirmishing for position, reached an agreement early in May, while the bituminous coal districts were more or less disturbed for weeks following. In many jobbing foundry centers strikes were started, and so far as the records of the Iron Molders' Union are concerned many of these strikes are still on. However, a considerable number of foundry firms have reached the point in the conduct of their business without the intervention of union committees, where the strike edict is a dead letter. Pickets are going through the motions of having shops under observation, but full forces are at work and a good product is being made, in some cases more than in the period preceding the strike. In a few centers where there were no strikes last year molders have recently asked and obtained advances in wages. The foundries still have plenty of work, and the desire of owners to get the full benefit of present conditions before the effects of business curtailment put in their appearance has made settlements of purely wage demands by no means difficult. Indeed, the foundries affected one year ago would have had no serious strikes, it is safe to say, if the questions of wages and hours had been unaccompanied with those of shop committees, signed agreements and uneconomical restrictions.

In urging that no wage concessions be made, President Gompers evidently considers that the bringing up of the wage issue by proprietors will be one of the developments in the period of recession that has been predicted. Possibly wage restrictions could be resisted successfully for a time, with the business tide falling, but if prices of products should fall there can be no escape from a reduction in labor cost, whether it comes by wage reductions or by the doing of more work for the same wage. It must not be forgotten that not only are wages at high point to-day, but the unit cost of labor is even farther beyond precedent. The latter condition, which results

largely from the inefficiency of labor, would be partly corrected at least by some falling off in business. Employers would then have opportunity to pick their employees, and the men capable of doing the most and the best work for the stated daily wage would be retained. This is what happened in 1904 in cases where wage agreements were in force preventing any reduction in rate. If James J. Hill is right in thinking that a time is not far ahead when there will be two jobs for three men, instead of three jobs for two men, the readjustment of unit labor cost will come, whatever happens to the daily wage rate.

So far as the machine shops of the country are involved the labor troubles of this year appear to be sporadic and exceptional. The long threatened general movement for an eight-hour day is still delayed, and until the International Association of Machinists gets a better hold than it seems likely to on the shops of the country, the eight-hour day may be regarded as quite remote.

In the iron industry, labor at iron mines, blast furnaces and steel works is so little organized that concerted action is not to be looked for. Most of the wage advances of the past two years have been made voluntarily by the manufacturers, and in some instances have been in the nature of bids for labor employed elsewhere at lower rates. Such competition for workmen will disappear when the available men outnumber the available jobs.

Referring to the Amalgamated Association of Iron, Steel and Tin Workers, the events of late years would seem to be a fair guarantee that a conservative course will be followed at the annual convention which opened at Toledo this week. For well-known reasons these conventions do not set the iron trade on tiptoe, as was the case 15 and 20 years ago. Wage advances urged by the association in the recent years of its less aggressive strength have had fair consideration, with results that in the long run have probably been more profitable to the members than any that could have been secured by repeated strikes. The organization of Pittsburgh District puddlers and of some other puddlers not heretofore in the Amalgamated Association, into the separate association known as the Sons of Vulcan, may create some division over the puddling rate. However, if the new organization asks a higher price for puddling than the Amalgamated Association puddlers it would probably have to strike to enforce it, and a strike without a strike fund could scarcely be called a foregone success. The fact that the Amalgamated Association was able to secure the advances for which it struck at Eastern mills last summer should count for something against the argument for a separate puddlers' organization. Yet its failure to get a 25-cent advance in the puddling rate, in its conference with the Western bar iron manufacturers last year, was probably the last straw with such puddlers as had been long agitating separation from the finishers. Nothing has appeared thus far, however, to indicate that the adjustment of the iron rolling mill scales will be more difficult in 1907 than in recent years, or that labor questions in the iron trade are to be a disturbing element in the coming months.

Ground Carwheels and the Life of Rails.

Reference was made in the editorial on steel rail failures in *The Iron Age* of May 2 to the responsibility of the railroads for some of the unfavorable conditions that have prevailed under the high pressure of the past two years. It was intimated that flat wheels must take their share of blame for the record of rail breakages in the

past winter. This brings up an interesting phase of the later development of grinding. The experts assert that under modern precision grinding practice the flat wheel can be eliminated to a very great extent if the foundries will produce wheels of uniform hardness throughout. Recent tests by one of the leading railroads of the country appear to have demonstrated that cars fitted with carefully ground wheels run with vastly less vibration than under the method of car wheel turning now generally followed. Common railroad practice in the past has not considered that a slight deviation from the designed contour of the wheel tread has important effects upon the tendency to develop a flat wheel. Grinding experts claim that such is the case, however. Their argument is that a wheel ground within a thousandth of an inch of true will wear equally under the brake shoe, providing, of course, that the wheel is equally hard throughout its circumference. If, on the other hand, according to this theory, there is an appreciable variation from the standard taper of the tread as measured by modern machine practice, the wheel is in reality oval, and under the action of the brake a flat wheel is developed, with its serious effect upon the rails.

Now that the railroads are more thoroughly awake to the serious problems imposed by the strains modern traffic methods have put upon rails, rolling stock and road bed, doubtless if a partial solution is to be found in the grinding of car wheels the system will be adopted as standard practice. It is only recently that the grinding machine has been developed to the point of handling work of such size with sufficient precision and rapidity of production. But now it is entirely possible, as has been demonstrated by at least one machine, which is grinding wheels from rough chilled castings. This is another instance of the increasing field of usefulness of the American machine tool. It will be no small advance in railroad practice, since more perfect wheels will prolong the life of steel rails and of the rolling stock itself by removing some of the jar and vibration.

A Kentucky View of the Railroad Question.

In these days of bailing railroads it is refreshing to note the stand taken by the Board of Directors of the Louisville Board of Trade. A committee, of which William Heyburn, vice-president of the Belknap Hardware & Mfg. Company, was a member, presented a series of resolutions on the railroad situation which met with such favor that the Board of Directors expressed its official approval and fixed May 10 as the time when the full membership might have an opportunity to ratify or reject the opinions thus advanced. The resolutions propound the belief that the population, prosperity and wealth of Kentucky would be greatly enhanced by the construction of a very large additional railroad mileage for the purpose of opening up enormously valuable resources of the State; that the utmost liberality on the part of State, county and municipal authorities of Kentucky should be extended toward all transportation companies who, in good faith and strict conformity with the national and State laws, undertake to furnish transportation facilities; that Kentucky should seize the opportunity that is presented by legislation in other States tending to make further railroad construction there unprofitable to offer a permanent home to capital for this purpose, and that 10 years' exemption from all taxes—State, county and municipal—of all new railroad mileage built in the State should be given to existing railroad companies or other companies desiring to come into the State, or by any other

individuals or corporations who desire to develop and enrich the State by providing it with increased means of transportation.

The resolutions include one stating that the board "favors legislation, if such be necessary, to prevent fictitious capitalization and the enforcement of laws to correct corporate abuses, as well as a severe punishment of those who fail to obey such laws; but it believes that what is now in order and for the interest of the public, as well as for the interest of the railroads, is co-operation between the people of the State and the railroads, with a view to the good of both and all." It follows this with the assertion, "We believe that if the railroads frankly and honestly accept their responsibilities to the public and endeavor to live up to them, then the public should as frankly attempt to make the business of the railroads successful and profitable and abandon all thought of hostility, harsh criticism and antagonistic legislation."

Whether the resolutions are ratified or disapproved by the general meeting of the Louisville Board of Trade, their general tenor may be taken as an indication that the business men of the country are awakening to the fact that something should be done to counteract the hostile attitude of the public toward railroad interests. In the correction of abuses the line has not been drawn as it should have been between desirable reforms and destructive legislation. It is creditable to Kentucky that a business organization of that State should take the lead in endeavoring to create a more wholesome public sentiment on this important question.

The Latest Fuel Saving Fallacy.

So-called fuel saving compounds are exploited in the daily press with increasing frequency. For years these mixtures have been brought out and their tests advertised, indicating wonderful economy by increasing the efficiency of the coal pile. But one after another they have dropped out of sight. Much has been written and printed lately concerning such a compound, consisting of oxalic acid, common salt, water and ashes. Some manufacturers and other owners of power plants have become interested, to the amusement or disgust of chemists and engineers. If this compound is accomplishing what is claimed it would seem that perpetual motion, or its equivalent, has come at last. A compound almost devoid of carbon is introduced into coal, and more heat units are extracted than were put in. It does not seem to be a case of producing freer combustion, for the fuel is said to endure and to maintain a boiler pressure much longer than if coal were employed under ordinary conditions. It is not that a greater per cent. of heat units reach the engine in the form of steam, but that there are more heat units to be divided between waste and applied power.

Water, composed of hydrogen and oxygen, decomposes when subjected to sufficient heat, as when mingled with coal, and the hydrogen with the assistance of the oxygen will burn, giving out heat units. But even under theoretically perfect conditions the burning hydrogen will produce only as much heat as was required in the decomposition of the water. If 64,800 calories were demanded of the coal in separating the two gases then the hydrogen will in theory give out just 64,800 calories, though as a matter of practice there would be material loss in the retransformation.

Much the same general condition exists when the new compound is introduced into the fuel. Neither water nor common salt contains carbon. The ashes have a

slight residue of unconsumed fuel; the remainder is unburnable mineral salts, no more valuable for fuel than the dust from a stone crusher. The percentage of carbon in oxalic acid is very slight. In one reported test, where steam is said to have been maintained in a boiler for several hours with an extremely small amount of fuel, plus the compound, the amount of carbon in the acid was no greater than that contained in a piece of coal the size of a chestnut. A very small percentage of the mixture was carbon. The fire must have converted the chemicals into gases, burned those which are inflammable and increased the number of heat units in the process, which, as in the case of the water, is impossible, a loss ensuing instead of a gain. It is stated that clinkers are consumed. The chemist answers, "What of it?" The amount of heat required to consume the carbon remaining in a clinker is greater than the heat given out by the clinker in the process of its combustion. One practical man who made a test of the compound under a power boiler states that his fire was slow in starting, then blazed hotly and brilliantly, and finally quickly died down. The clinkers seem to have burned, but the ashes were as much in evidence as ever. Under such conditions heat which should have been given out evenly through a given period may have been generated practically all at once. The fire had to use its energies in decomposing the chemicals; then the gases blazed fiercely, with highly colored effects from the sodium, and soon died away. Common salt added to a hot fire seems to burn freely; yet it adds no heat, but rather colors the flames.

Water may be employed with soft coal to excellent effect, it is claimed. Probably other noncarbonaceous additions to coal may have their purposes. But they do not add to the heat. Their function is other than what the parents of fuel compounds claim for the elements of their mixtures.

Several men of scientific reputation have publicly pointed out the fallacy of "discoveries" such as these. But the idea that the poisonous oxalic acid and its fellow ingredients will have important effects upon the world's fuel supply seems still to have sufficient vitality to keep up its newspaper travels.

CORRESPONDENCE.

The Follow-Up Letter System.

To the Editor: We have read with a great deal of interest the editorial article in your issue of May 2, entitled "Abuses of the Follow-Up Letter System." It is a very timely article, and one that strikes at the right spot. We have been annoyed during the past six or eight months by this system, on account of receiving letters that were positively of no interest. We think that your calling attention to this will have the effect of weeding out this useless literature. STEEL MANUFACTURER.

PITTSBURGH, PA., May 4, 1907.

Announcement is made that the engineering firm of Frazier, Fox & Spencer, 712-718 Rockefeller Building, Cleveland, was dissolved May 1. J. W. Frazier and J. H. Fox will continue the business of consulting engineers at the same offices under the firm name of Frazier & Fox.

The Chicago & Northwestern Railway Company, Chicago, has just issued a book in which the terminals of the system in Milwaukee are described in detail accompanied by maps in colors. The aim of the book is to suggest sites for manufacturing plants and other business undertakings.

Complaints of Freight Rates on Southern Iron.

WASHINGTON, D. C., May 7, 1907.—Several complaints have reached the Interstate Commerce Commission with regard to the recent advance in the freight rates on Southern pig iron to Northern points which went into force on April 1. The matter has been taken up informally by the commission in the hope that a satisfactory adjustment may be reached, but if this is found to be impracticable it is probable that formal protests will be filed by the interested parties, the issue joined and the case set for hearing before the commission.

The new rates have now been in effect more than a month, and consumers are protesting energetically against their further continuance, not only on the ground that they are too high, but also that the division on the Ohio River is inequitable. The distance from Birmingham to the river is but a little more than from the river to Chicago, but the rate for the first half of the haul is \$2.75, as against \$1.60 for the last half; that is to say, the Southern railroads receive \$1.15 per ton more than the Northern roads for almost the same service.

The commission officials are especially interested in the argument said to have been put forward by certain railroad men in support of the advanced rates. These men are quoted as saying that iron is more valuable today than it has been, and that it is only equitable that it should pay a higher rate. The reply of certain consumers, however, in the opinion of the officials, is conclusive. They are quoted as declaring that the advance in the price of iron is due to a considerable extent to the inability of consumers to secure prompt deliveries because of car shortage and lack of other facilities for which the railroads are solely responsible. Being compelled to go into the open market for needed supplies, the consumers have forced the price up on themselves, but the inefficient service of the railroads is really responsible for the advance.

The Alabama iron companies and other industrial interests of that State are also complaining against the action of certain railroads in raising the rates on all shipments into the State from Central Freight Association territory. A formal protest has been filed with the Interstate Commerce Commission by the Montgomery Freight Bureau, in which a dozen or more of the leading Western railroads are made defendants. Copies of the complaint have been served on the roads, which have been given until May 17 to answer.

The Routing of Shipments.

Manufacturers in the iron and steel and other trades throughout the country are considerably exercised over the operation of a clause in the comprehensive tariff circular known as I. C. C. 12a, recently issued by the Interstate Commerce Commission, which went into force May 1. One of the provisions of this circular, relieves carriers of any necessity to observe instructions of shippers as to intermediate routing. Manufacturers are thus deprived of all control of their raw materials or finished products in the hands of the carriers, and they thereby lose important advantages which they have heretofore enjoyed. Hereafter it will be impossible for a manufacturer who may sell large quantities of goods to a certain railroad to reciprocate by routing his shipments of finished products over that line. Such deals are frequently made to the mutual advantage of both manufacturer and railroad and without violation of the letter or spirit of any interstate commerce law or regulation. It is obvious that the new rule may frequently occasion delays that would have been avoided if the manufacturer had been permitted to route his goods according to information based on special investigation or past experience.

Those who complain of the new rule and who hope to have it rescinded believe that they will be able to impress the commission with the undesirability of a regulation which will enable the railroads in any given territory to establish a tonnage pool, and much emphasis will be placed on this phase of the subject. There is reason to fear, however, that the commission will not be found to be as strongly opposed to this form of pooling as is thought by the complainants in this case. Several mem-

bers of the commission are believed to favor pooling to a much greater extent than would be possible under this ruling; nevertheless, all representations made in the matter will receive careful consideration.

W. L. C.

Recent Customs Decisions.

Ignition Wire Cable.

The Board of United States General Appraisers May 6 handed down a decision in the case of the Packard Motor Car Company, Detroit, in which it was held that so-called ignition wire cable is properly dutiable under the provision in the tariff act as a manufacture of rubber, with duty at the rate of 30 per cent. The cable is manufactured of wire and rubber, and when the merchandise was entered at the custom house it was deemed that the metal portion was of greater value than the rubber component. Consequently, duty was assessed at the rate applicable to metals, 45 per cent., plus 1¼ cents per pound. At the request of the importers, the official sample of the cable was submitted to the examiner who passes such merchandise at New York, and, in accordance with his report, the Board of Appraisers sustains the contention for the lower duty.

Bass and Trout Files.

In a decision by I. F. Fischer the Board of Appraisers held May 6 that the George Tritch Hardware Company, Denver, Colo., erred in its appeal for lower duty on bass and trout files. The articles were returned for duty at 45 per cent. under the provision in the tariff for manufactures of metal. It was maintained by the importer that the rate should be only 25 per cent., under the paragraph for gut.

Opposition to the German-American Treaty.

Powerful domestic interests have lined themselves up in opposition to the changes in the Customs Administrative act contemplated in the new tariff treaty just negotiated with Germany. While no official statement has been made by the representatives of the American Protective Tariff League, it is known that the organization will wage an active campaign against any modification of the existing act, on the ground that to permit the export price to be accepted by American customs officials as the foreign market value of merchandise would, in effect, nullify the protective provisions of the tariff in relation to domestic producers. Another point objected to by the domestic interests relates to the amendment of the section of the law granting to importers a range of 10 per cent. in cases of undervaluation before the penal duties accrue. The belief is expressed that if Germany is to be allowed to enter merchandise into this country on the export valuation, the result will be to kill American trade in the competing lines. Another element likely to be projected into the situation before the meeting of Congress is the position that may be assumed by organized labor. The propaganda about to be waged against the amending of the administrative law will include requests to all domestic manufacturing and producing interests to flood the White House with protests, not alone against the alteration of the act itself, but against the other concessions made to Germany in the compact.

Labor Conditions in San Francisco.

Charles M. Schwab, president of the Bethlehem Steel Corporation, which controls the Union Iron Works of San Francisco, is quoted as saying:

"Our concern will never take a battleship or any other kind of a ship to be built in San Francisco as long as the labor conditions are maintained as at present. We lost \$2,500,000 on the last three battleships contracted for and just completed, and have lost more money in our work in San Francisco than we have made at our other works throughout the country. I have never seen anything like these conditions anywhere. When we took control of the Union Works the men were working 10 hours a day, but it was soon nine hours. It is not so much to the time as it is greatly because of their infe-

rior and inefficient workmanship that we object. Unless labor conditions change here all manufacturing must stop, as no living man would dare bid on future contracts with your labor organizations constantly raising wages and reducing the hours of labor."

Labor Notes.

Some 600 boiler makers employed in works in Boston and vicinity have gone on strike because of the refusal of the employers to grant a demand for shorter hours and an advance in wages. The original demand was for an eight-hour day, a reduction from a nine-hour schedule, and an increase in wages of 15 per cent. This demand was made by the two rival unions, Lodge No. 9, United Boiler Makers and Iron Shipbuilders of North America, and Lodge No. 431, International Brotherhood of Boiler Makers and Iron Shipbuilders and Helpers of North America. The employers declined to make such sweeping concessions, and a compromise was proposed, waiving the eight-hour day. The employers offered an advance of 7½ per cent., which was accepted by Lodge No. 431. Lodge No. 9 insisted upon a 10 per cent. advance, and, it being refused, went on strike. The concerns affected are the Atlantic Works, Hodge Boiler Works and Bertelsen & Petersen Company, East Boston; James Russell Boiler Works, Daniel Russell Boiler Works and Cunningham Iron Works, South Boston, and Campbell Iron Works, Cambridge, the last only to the extent of a few men, however. The works of the other affected companies are practically idle, no attempt having yet been made to fill the places of the strikers.

Reports that a serious strike had occurred at the sheet mills of the Whitaker-Glessner Company at Martins Ferry, Ohio, are untrue. Four firemen quit work and called it a strike because of their inability to force the company to pay them more money than is paid at other plants for similar work. The places of these men have been filled, and the entire plant resumed operations in full on Monday, May 6.

The General Fireproofing Company's Improvements.

The General Fireproofing Company has about completed additions to its plant at Youngstown, Ohio, which will double the capacity of its all-steel furniture factory, and provide for the lug bar and girder frame departments as complete an equipment as has been possessed for some years past by the Herringbone expanded steel lath and expanded metal shops. For the manufacture of pin connected girder frames a shop, 85 x 200 ft., has been erected, with a railroad spur running through the entire length of the building. Adjoining the girder frame shops is the steel yard, piled high with stock lengths of cold twisted lug bars and the square bars used in fabricating the girder frames. This bar yard is covered by an electric crane, having 100 ft. span and a runway 320 ft. long, which has just been erected, and which, because of its unusual size, excites great interest.

To accommodate the steady growth of the all-steel furniture department a reinforced concrete building, 60 x 180 ft., two stories, has been erected adjoining the old factory. By the use of pin connected girder frames, beams and girders of the same depth are provided, which greatly facilitates hanging shafting. The office building has been enlarged to accommodate the reinforced concrete department by the erection of a two-story and basement addition, 36 x 73 ft., connected with the former office by a wing, 36 x 36 ft. Cement plaster applied over Herringbone expanded steel lath is used for the exterior finish, and instead of woodwork in the addition all-steel baseboards, moldings, window and door casings and doors, finished like mahogany, have been used. In fireproofing the structure art is not sacrificed to utility. So closely are the rich color and beautiful grain of the wood reproduced that it is difficult to believe that the effect has been obtained on steel.

PERSONAL.

Earl McIntire has been appointed superintendent of construction for the Republic Iron & Steel Company, at Youngstown, Ohio.

William H. Rea, formerly of the Robinson-Rea Mfg. Company, Pittsburgh, but later connected with the Mesta Machine Company, has been made chief smoke inspector of Pittsburgh.

F. E. Reed, president and treasurer of the F. E. Reed Company, Worcester, Mass., has returned home from a three months' pleasure trip. Most of his time was passed in California.

Henry M. Lane, 1137 Schofield Building, Cleveland, Ohio, and W. M. Carr, 120 Liberty street, New York, have established offices at both addresses under the name of Lane & Carr, as foundry and metallurgical engineers, giving attention to steel, malleable iron and gray iron foundry practice, including furnace and plant designs and consultation. Mr. Lane was the editor of the *Foundry*, Cleveland, for a number of years.

Charles A. Moore of Manning, Maxwell & Moore, New York, president of the American Protective Tariff League, is a member of a party now taking an extended auto tour on the Continent. On April 16 the party made the first auto trip up Mount Vesuvius since the late eruption, which was taken over the new road just completed through the lava beds. Mr. Moore expects to return early in June.

Rowe Price, cashier of the First National Bank of Tallapoosa, Ala., has been elected secretary and treasurer of the Southern Car Wheel Iron Company, to succeed the late Ralph Brown.

Charles L. Greene has been appointed assistant superintendent of the Birmingham Iron Company's Vanderbilt Furnace, at Boyles, Ala.

The General Fireproofing Company, Youngstown, Ohio, announces coincident with establishing a branch office at 82 Second street, San Francisco, the appointment of W. W. Thurston as district manager. Another recent acquisition by the company is W. E. Ramsey, formerly engineer with the Expanded Metal Fireproofing Company, at Chicago. Mr. Ramsey is at present with the home office at Youngstown. Jesse Briegel has been engaged by the Chicago office as salesman. Through his previous connections as adjuster with liability insurance companies he has formed an extensive acquaintance among contractors, factory owners and employers.

S. T. Wellman was elected chairman of the Wellman-Seaver-Morgan Company, Cleveland, last week, in place of J. W. Seaver, who recently resigned and withdrew from the company.

Fred. Krebs, general sales manager of the Gautier department of the Cambria Steel Company, Johnstown, Pa., will remove his headquarters to Philadelphia.

M. H. Parker, president of the National Metal Trades Association, is absent on a business trip to Mexico, in the interest of the American Tool & Machine Company, Boston, of which he is the general manager.

F. W. Coburn, metallurgical engineer at the Sparrows Point plant of the Maryland Steel Company, resigned May 1 to assume the management of the Coburn Foundry Company, Seventy-fifth street and Island road, Philadelphia.

C. A. Johnson, president of the Gisholt Machine Company, Madison, Wis., sailed for Europe Tuesday.

Hugh W. Adams of Hugh W. Adams & Son, New York, sailed for Europe May 4, expecting to return in September.

To fill the position made vacant by the death of Patrick J. Geraghty, formerly secretary and purchasing agent of the Griffin Wheel Company, Chicago, the following officers have been elected: G. Francis Griffin, secretary; S. L. Prest, formerly comptroller, treasurer, and F. I. Cordo, general purchasing agent.

The Cincinnati Iron Store Company, machinery and equipment department, Cincinnati, Ohio, has added to its sales organization Harry E. Wessling, for years con-

nected with the Dreses Machine Tool Company, and latterly with the William Powell Company. His thorough familiarity with modern shop practice will be of advantage in his new connection.

Leopold Wolf, formerly with the firm of L. Wolf & Bro., scrap iron dealers, Cincinnati, Ohio, has associated himself with another scrap iron house, the Hilb & Bauer Company. The latter concern on May 1 took possession of its new plant at 289 Mill street, which will be operated in connection with the old plant at 830 West Front street.

R. B. Wellman resigned May 1 as superintendent of the open hearth steel department of the Atlanta Steel Company, Atlanta, Ga.

Louis Ruhl of the Roessler & Hasslacher Chemical Company, New York, expects to sail May 16 for a short trip to Europe.

OBITUARY.

GEORGES DE LA BOUGLISE, a famous French mining engineer, who was more particularly identified with copper mining in all parts of the world, died in Paris, April 15, aged 65 years.

MARSHALL L. HINMAN, who with the late Horatio G. Brooks, founded the Brooks Locomotive Works, died May 3, in Dunkirk, N. Y., aged 66 years. He was for several years president of the company, and was secretary and treasurer up to the time it was merged with the American Locomotive Company in 1901. He was a native of Cattaraugus County, N. Y., and was Mayor of Dunkirk from 1885 to 1887.

CHARLES D. GRIMES, president of the C. D. Grimes Machine Company, and member of the firm of Legler, Grimes & Eilerman, Dayton, Ohio, died April 19, from erysipelas, after an illness of one week. Mr. Grimes was born in 1862, and for the past 23 years was a resident of Dayton. Before engaging in business for himself he was connected with the National Cash Register Company in the capacity of mechanical expert. He had a wide acquaintance in the machinery trade, and was recognized as possessing great mechanical skill and ability.

Mild Steel in Shipbuilding.

In a paper on the "Evolution of the Modern Cargo Steamer" read before the Institution of Naval Architects, by S. J. P. Thearle, that authority says:

"The evolution of the cargo steamer during the period which we select for our retrospect has been materially influenced by the introduction of mild steel into shipbuilding. It would be scarcely possible to exaggerate the beneficial influence which the substitution of that material for iron has had upon the development of the cargo steamer. Not only have we had an ideal material to deal with, but improvements in the steelmaker's art have resulted in the production of sections more and more suited for the shipbuilder and the ship. He has given us longer, broader and thicker plates, longer and heavier bars, smoother surfaces, and in every respect better structural materials upon which to work. This improvement in quality and suitability of material has had its influence upon the quality of workmanship, as seen in the fitting together and the riveting. The whole result is that during the 25 years or thereabouts that mild steel has been used in shipbuilding, workmanship and finish have been always improving; so that the cargo steamer of to-day is a better and a stronger vessel, both absolutely and also in proportion to her scantlings, than ever she has been before. It remains to be seen whether further improvements will be made in steel manufacture, and whether a low priced trustworthy steel of higher tenacity than is used at present will be produced, having all the excellent qualities of the mild steel now employed in shipbuilding. Should such an article be forthcoming, it may be expected that, with it, still further advances will follow in the evolution of the cargo steamer."

Record Rate of Pig Iron Production.

Weekly Capacity on May 1 About 10,000 Tons More Than the Highest Previously.

After months of alternating increase and falling off in the rate of pig iron production, the statistics of May 1 show that the blast furnaces of the country have taken a decided turn toward larger output. Fourteen coke furnaces were blown in last month, and only four were blown out, making a net gain of 10. A number of these came in in the latter part of April, so that they did not contribute greatly to the product of the month, but count in the column of active capacity on May 1. On that date the 323 furnaces in blast had a weekly capacity of 523,912 tons, against 497,756 tons a week for 313 furnaces on April 1. Since the opening of this month a further addition has been made to the active list. While steel works furnaces have furnished the bulk of the increase in capacity, merchant furnace capacity is also greater. Only a small part of the increase, however, comes from the South. In April, a 30-day month, the output of the coke and anthracite furnaces was 2,216,558 tons, against 2,226,457 tons in the 31 days of March. The Northern steel works furnaces produced 1,446,788 tons in April, against 1,424,827 tons in March. Coke and anthracite pig iron production is now at a yearly rate of over 27,000,000 tons. The table below gives the production of the coke and anthracite furnaces in April, as compared with the figures for the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	December. (31 days)	January. (31 days)	February. (28 days)	March. (31 days)	April. (30 days)
New York...	134,393	136,057	126,055	151,142	142,241
New Jersey...	33,057	34,323	29,616	36,470	30,715
Lehigh Valley...	52,868	58,930	51,485	60,754	63,926
Schuylkill Val.	62,741	62,118	57,388	61,601	59,670
Lower Susquehanna and Lebanon Val.	61,481	58,101	53,010	62,946	67,665
Pittsburgh Dis.	525,312	505,514	481,868	511,637	530,527
Shenango Val.	172,604	171,830	154,966	172,748	175,441
West. Penn...	124,007	122,641	111,933	121,948	126,395
Md., Va., and Kentucky...	85,520	87,919	83,135	93,080	96,210
Wheeling Dis.	128,294	102,158	98,929	97,158	118,747
Mahoning Val.	187,577	196,426	168,187	179,001	177,425
Central and North Ohio.	162,930	172,031	171,838	185,598	168,537
Hocking Valley and Hanging Rock...	35,509	31,911	33,606	33,792	28,677
Ill., Mich., Minn., Wis., Mo., and Colo.	290,281	283,934	259,964	278,655	252,714
Alabama...	139,432	145,233	126,642	142,281	142,174
Tennessee, Georgia and Texas...	39,309	36,481	36,446	37,646	35,494
Totals	2,235,306	2,205,607	2,045,068	2,226,457	2,216,558

In addition to the above the charcoal furnaces of the country produced about 35,000 tons of iron last month.

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies—Gross Tons.

	Fig.—Total production.—				Spiegeleisen and ferromanganese.
	1905.	1906.	1907.	1908.	
January	1,129,042	1,358,015	1,406,397	26,305	21,477
February	1,027,937	1,226,760	1,317,923	26,988	19,444
March	1,232,255	1,400,395	1,424,827	23,595	31,091
April	1,222,710	1,333,591	1,446,788	28,054	26,527
May	1,287,438	1,372,423		29,447	
June	1,149,404	1,293,437		22,737	
July	1,114,409	1,323,391		20,153	
August	1,186,050	1,237,485		18,327	
September	1,262,033	1,264,380		24,078	
October	1,370,960	1,452,200		23,517	
November	1,334,644	1,411,350		29,119	
December	1,356,962	1,445,528		21,707	

The list of furnaces blown out in April includes Northern at Port Henry, N. Y., one Lock Ridge of the Thomas Iron Company in the Lehigh Valley, one Central in northern Ohio, one Hubbard in the Mahoning Valley.

Among furnaces added to the active list in April were No. 3 Lackawanna at Buffalo, Keystone in the Schuylkill Valley, the new Bethlehem Furnace E in the Lehigh Valley, Atlantic in the Shenango Valley, Nittany in western Pennsylvania, No. 3 of the Pennsylvania Steel Company in the Susquehanna Valley, one Shoenberger in the Pittsburgh District, Cleveland in northern Ohio, one Iroquois in Illinois and one Bay View in Wisconsin, Mary in the Mahoning Valley, one Shelby and one Woodward in Alabama and one Dayton in Tennessee.

In the following table is given the active furnace capacity per week on May 1 and April 1, of furnaces producing coke and anthracite iron:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.		May 1.		April 1.	
	Number	Capacity	Number	Capacity	Number	Capacity
New York:						
Buffalo	14	28,063	13	28,801		
Other New York	10	4,422	5	5,325		
New Jersey	8	6,996	8	8,106		
Spiegel	2	173	1	186		
Pennsylvania:						
Lehigh Valley	24	13,781	20	13,097		
Spiegel	3	1,134	3	1,071		
Schuylkill Valley	13	14,110	12	13,251		
Spiegel	1	721	1	654		
Low. Susquehanna	8	8,021	5	5,803		
Spiegel	1	0	1	676		
Lebanon Valley	10	7,997	10	7,724		
Pittsburgh Dist.	42	122,471	38	110,895		
Spiegel	3	2,812	3	2,534		
Shenango Valley	20	41,257	19	39,007		
West. Penn.	25	29,912	19	26,712		
Maryland	4	8,835	4	8,710		
Wheeling Dist.	14	27,699	14	22,941		
Ohio:						
Mahoning Valley	18	43,541	17	40,963		
Central and Northern and Michigan	21	43,210	20	42,189		
Hocking Valley and Hanging Rock	12	6,690	9	6,981		
Illinois	22	43,877	18	44,802		
Spiegel	2	1,814	2	1,864		
Minnesota	1	1,421	1	1,192		
Wisconsin	5	3,668	3	2,825		
Missouri	1	577	1	749		
Colorado	4	5,273	3	6,216		
Spiegel	1	0	1	686		
The South:						
Virginia	23	10,289	16	10,012		
Kentucky	7	3,294	4	2,586		
Alabama	47	33,596	28	32,389		
Tennessee	18	7,492	12	7,728		
Georgia and Texas	3	766	2	836		
Totals	387	523,912	323	497,456		

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1902:

	Capacity per week.		Capacity per week.
May 1	523,912	August 1	246,092
April 1	497,456	July 1	272,301
March 1	511,035	June 1	336,107
February 1	492,359	May 1	368,244
January 1, 1907	507,397	April 1	337,257
December 1, 1906	513,860	March 1	308,751
November 1	500,580	February 1	273,692
October 1	469,685	January 1, 1904	185,636
September 1	441,426	December 1, 1903	244,156
August 1	449,908	November 1	273,715
July 1	460,570	October 1	353,142
June 1	472,622	September 1	360,197
May 1	484,031	August 1	353,681
April 1	484,240	July 1	384,825
March 1	479,737	June 1	388,178
February 1	482,156	May 1	373,496
January 1, 1906	463,673	April 1	386,215
December 1, 1905	475,814	March 1	347,424
November 1	460,449	February 1	335,239
October 1	445,468	January 1, 1903	346,073
September 1	412,563	December 1, 1902	336,617
August 1	410,088	November 1	330,110
July 1	408,617	October 1	337,837
June 1	443,092	September 1	328,243
May 1	442,031	August 1	328,745
April 1	432,564	July 1	303,793
March 1	403,157	June 1	337,492
February 1	403,792	May 1	337,627
January 1, 1905	377,879	April 1	331,140
December 1, 1904	357,846	March 1	316,039
November 1	334,249	February 1	325,440
October 1	319,249	January 1, 1902	291,992
September 1	291,573		

NEWS OF THE WORKS.

Iron and Steel.

The Interstate Steel Company, Farmers' Bank Building, Pittsburgh, is adding a cold rolling and annealing department to its plant at Brackenridge, Pa., which will be contained in a steel building, 60 x 200 ft., now being erected by J. Vollkommer & Co. Two more hot mills are also being added to this plant, giving it a total of seven hot mills and four cold mills.

The Allegheny Steel Company, Farmers' Bank Building, Pittsburgh, is adding one more hot sheet mill to its plant at Avenue, Pa., giving it a total of eight hot sheet mills and six cold mills. This company manufactures high grade steel sheets and plates, and has a very heavy tonnage on its books.

Joseph H. Berry of Berry Brothers, Detroit, Mich., and others have purchased the plant of the Elk Rapids Iron & Chemical Company at Elk Rapids, Mich., consisting of a charcoal blast furnace, chemical works and 51 charcoal kilns.

The Star Mfg. Company and the Dartmouth Rolling Mill Company, which recently absorbed the plant of the Dartmouth Machine & Forge Company, Dartmouth, N. S., have combined, the consolidation to retain the name of the Star Mfg. Company.

The blast furnace of the Northern Iron Company, Port Henry, N. Y., was blown out for repairs April 17.

Keystone Furnace of the Reading Iron Company, Reading, Pa., blew in April 6.

Atlantic Furnace of the Republic Iron & Steel Company, New Castle, Pa., which went out in September, 1906, for overhauling and improvements, was blown in April 7.

The blast furnace of the Nittany Iron Company, Bellefonte, Pa., which had been undergoing repairs since February 25, was blown in April 18.

The new Furnace B of the Northwestern Iron Company, Mayville, Wis., was blown in May 2. Furnace A, which has been undergoing repairs for some weeks, will be blown in about June 1.

Furnace A of the Iroquois Iron Company, South Chicago, Ill., was blown in after relining on April 22.

One of the two furnaces of the Andrews & Hitchcock Iron Company, Hubbard, Ohio, which went out for repairs early in April, was expected to blow in this week.

Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, which had been idle and under repair since early in April, resumed April 30.

The Woodward Iron Company, Woodward, Ala., has had two blast furnaces in operation since April 15, on which date one furnace was blown in after repairs.

The Dayton Coal & Iron Company, Dayton, Tenn., blew in its second stack after repairs on April 21.

One Shoenberger furnace of the American Steel & Wire Company, Pittsburgh, was blown in in April after relining.

Furnace A of the South Chicago Furnace Company, South Chicago, Ill., which went out on March 22 for relining and the rebuilding of the shell, was blown in May 4.

General Machinery.

H. B. Perine, 816 First avenue, South, Seattle, Wash., dealer in machinery and supplies, has reorganized and incorporated his business under the name of the Perine Machinery Company, with a capital stock of \$25,000. H. B. Perine is president and manager; C. L. Vickers, vice-president, and S. W. Fuertel, secretary and treasurer.

The Reinforced Brazing & Machine Company, Arrott Building, Pittsburgh, whose works in that city was recently destroyed by fire, will rebuild on the old site and will erect a steel and brick building, 100 x 100 ft., which will be equipped with machine shop tools and necessary brazing equipment.

Reports from various tool and machinery manufacturers throughout the West indicate that order books are not only filled with business for forward delivery, but that the supply of new orders daily developing is plentiful. Recent shipments made by the Excelsior Tool & Machine Company, East St. Louis, Ill., include two automatic railroad spike machines to the Atlanta Steel Company, Atlanta, Ga.; coal briquetting machine to Kansas City, Mo.; one brick machine to Carrollton, Texas, and a number of presses to various stove manufacturers. Of the orders now in hand there are nine friction saws for Joseph T. Myerson & Son, Chicago; a 96-in. power squaring shear for the Monitor Stove & Range Company, Cincinnati; one squaring shear for Fuller-Warren Company, Troy, N. Y., and two complete range making equipments for shipment to Australia.

The Alliance Machine Company, Alliance, Ohio, builder of electric traveling cranes, rolling mill and special machinery, is making improvements to its plant in the way of buildings and machinery equipment, which when completed will double its output capacity. Contracts covering these improvements have already been let and it is expected that the new shops will be ready for operation by July 1.

The Malang-Stevens Machinery Company, Joplin, Mo., recently incorporated with a capital stock of \$10,000, is successor to B. M. Stevens & Co., manufacturers of mining machinery. The shop equipment has been increased by the purchase of several new machines.

Among the recent electric crane installations furnished by the Northern Engineering Works, Detroit, Mich., are one 15-ton alternating current to the Edison Sault Electric Company, Sault Ste. Marie, Mich., and a 10-ton three-motor electric jib crane for the pipe foundry connected with the Texas State Penitentiaries.

In addition to extensive improvements recently made, the Anderson Foundry & Machine Works, Anderson, Ind., is contemplating the erection of new buildings to replace the present frame machine shops. Plans for this work are, however, not yet fully matured.

The Noye Mfg. Company, Buffalo, N. Y., manufacturer of flour mill machinery and other special mill machinery, engines, &c., has been reorganized with increased capital to provide for doing a more extensive business. Richard K. Noye remains president of the company, Wm. H. Glenn is been elected vice-president, and Henry S. Madden secretary, treasurer and general manager, the latter two gentlemen representing new interests in the company.

The B. F. Sturtevant Company, Boston, Mass., has recently sold to the Nevada Consolidated Copper Company, Ely, Nev., one 60,000 cu. ft. and one 12,000 cu. ft. blower and forced draft fan blowers for 3200-hp. Babcock & Wilcox boilers; high pressure rotary type blowers to the Link-Belt Company, Chicago, Ill.; Seybold Machine Company, Dayton, Ohio; Whitin Machine Works, Whitinville, Mass.; Phoenix Bridge & Iron Works, Montreal; Hawley Down Draft Furnace Company, Chicago, Ill.; McGill University, Montreal, Canada; Carr Engineering Company, Los Angeles, Cal.; Whiting Foundry Equipment Company, Harvey, Ill.; Joseph J. Anderson, Chicago, Ill.; Watson-Stillman Company, Aldene, N. J. The company recently furnished mechanical draft equipment to the Atha Steel Casting Company, Newark, N. J.; Edison Electric Illuminating Company, Brooklyn, N. Y., and an electrically driven fan to remove smoke from the new running shed of the American Locomotive Company, Schenectady, N. Y.

The Walcott & Wood Machine Tool Company, Jackson, Mich., has increased the capital stock from \$60,000 to \$100,000.

The General Pneumatic Tool Company, Montour Falls, N. Y., has taken another year's lease on the Rochester Bridge & Construction Company's plant and will probably not build its proposed new plant until next spring. The company has lately installed some additional machine tools.

The Robertson Machinery Company, Welland, Ont., is to replace the buildings recently destroyed by fire with a machine shop and foundry, 60 x 150 ft., and storehouse, 40 x 150 ft., the former to be of reinforced concrete and the latter of galvanized iron. The company has installed machinery in temporary quarters which were placed in operation May 1, and the first hoisting engine was shipped May 3, just two weeks after the fire.

Because of a rapidly growing demand, to meet which the limited capacity of its plant is inadequate, the Novelty Iron Works, Dubuque, Iowa, is contemplating a change of location and has under consideration propositions for new locations from several sources. The product of this firm consists of power hammers, key seating machines, hand power punches, castings and general machine work.

The Acme Road Machinery Company, Frankfort, N. Y., has not yet prepared plans for rebuilding its plant which was recently destroyed by fire, but it is likely that rebuilding will commence as soon as the insurance is adjusted.

The Superior Iron Works Company, Superior, Wis., has incorporated. The designing and building of special engines and machinery for use in connection with cable haulage, dredges, derrick and coal docks constitute the special features of the company's work. Frank Hayes is president and treasurer, Hiram Hayes vice-president and Ewart H. Williamson secretary.

The San Antonio Machine & Supply Company, San Antonio, Texas, is making improvements to its plant, which will be enlarged by a 60 x 100 ft. addition to its boiler shop.

The Adrian Machine Tool Company, Adrian, Mich., has been recently organized for the manufacture of machine tools, stamping and forming dies, and general sheet metal and job work. Charles T. Collar is president; Frank V. Keep, secretary and treasurer; Charles F. Kruger, superintendent.

Power Plant Equipment.

The Best Mfg. Company, Pittsburgh, has received through Stewart-Beebe & Co., engineers, a contract for the steam superheating and exhaust piping for the new power plant of the Chicago Portland Cement Company at Oglesby, Ill., which is expected to be completed in July. The company has many other contracts, including extensions for the steam piping and exhaust system for the Alpha Portland Cement Company, Alpha, N. Y.; new work on steam and exhaust piping for the Lehigh Portland Cement Company, New Castle, Pa.; extensions to the cement

plant of the Alsen Portland Cement Company, Alsen, N. Y., and a contract for the steam piping system for the Edison Illuminating Company, Williamsport, Pa. All these contracts call for necessary valves and fittings.

To provide for contemplated extensions and improvements to be made within the next five years, the New Orleans Railway & Light Company, New Orleans, La., has issued \$5,000,000 of five-year coupon notes, the proceeds of which will be used during that period as the occasion demands for the purchase of equipment and plant extensions.

An issue of \$43,000 of bonds has been issued by the City of Herrington, Kan., to provide funds for an electric light plant, which it is proposed to install without delay.

The Minneapolis Steel & Machinery Company, Minneapolis, Minn., which in addition to the fabrication of structural steel builds the Twin City Corliss engines and gas producers, has found it necessary on account of expanding business to make extensions to its plant. A new building approaching completion is being provided as an erection room for the engine department, and will cover a space 60 x 293 ft. The entire floor will be traversed by suitable traveling cranes.

The Globe Iron Works Company, Menominee, Wis., manufacturer of gas engines, at a recent meeting elected the following officers: T. B. Wilson, president; H. W. Young, vice-president; Oscar Wilson, secretary; E. G. Kimball, treasurer; F. E. Watkins, general manager.

The Sheffield Electric Light Company, Sheffield, Ill., which recently secured a 20-year extension of its franchise, together with a 10-year pumping and lighting contract from the city, contemplates reorganization and enlargement of its plant. H. W. Booth is secretary.

The Jos. Schlitz Brewing Company, Milwaukee, Wis., is erecting a pumping plant of 6,000,000 gal. capacity, for the service of which two types of pumps will be installed, one of high duty type, built by the Allis-Chalmers Company, Milwaukee, and the other a centrifugal pump, built by the De Laval Steam Turbine Company, Trenton, N. J. These pumps will take suction from the river and deliver the water through an 18-in. pipe to a distance of 1500 ft. from the station. The centrifugal pump will be installed merely as a reserve unit to replace the high duty pump in case of accident. The service of the entire plant will be devoted to the condensing of ammonia fumes into liquid ammonia, and will supplant in part the supply of water now taken from the city mains.

Foundries.

The Hubbard Foundry Company has been organized at Hubbard, Ohio, with a capital of \$25,000, the incorporators being W. D. Wright, M. T. Farragher, T. W. Crawford, P. J. Reddington and S. M. Thompson.

The Reading Stove Works, Reading, Pa., has awarded a contract to Beard & Co. for the erection of the three foundry buildings and a fireproof brick warehouse. The foundry buildings will be 40 x 120 ft. and the warehouse 50 x 60 ft.

Owing to the inability of the local shops to supply the required castings for its use, the Silberzahn Gas Engine Company, Marinette, Wis., has added a foundry department to its plant. A part of the old Marinette Iron Works building has been utilized for this purpose.

The Cleveland Foundry Company, which recently added a large building to its plant, finds that its capacity for the manufacture of oil stoves is still too small and will soon begin the erection of a two-story addition to its new building. All the necessary equipment has already been purchased.

J. H. Newbury, Goshen, N. Y., whose foundry was recently destroyed by fire, will rebuild, making the new plant about one-third larger than the old one. As the machinery department was damaged very little no new machinery will be required, but later on a new engine will be needed. For the present Mr. Newbury will make the engine which went through the fire do until the new building is placed in operation.

The Davison-Namack Foundry Company, Ballston Spa, N. Y., has let a contract for the erection of an addition to its foundry which is 34 x 130 ft., center bay, with side bays the entire distance, 20 ft. wide. The addition is to be a 96-ft. extension to the center bay, which will give a crane runway of 226 ft. The company is building an addition to its pattern storage house, 20 x 90 ft., and is putting in some new equipment.

The plant of the Prescott Company, Menominee, Mich., builder of sawmill machinery, has been enlarged by the addition of a new steel casting plant, now approaching completion. Besides furnishing castings for its own use, a large part of the new foundry capacity will be devoted to supplying steel castings for the general trade. The iron foundry in connection with the plant has been equipped with molding machines, and the enlargements made have necessitated an increase of the power plant. To meet this requirement a new Murray rolling mill type Corliss engine, 200-hp. capacity, direct connected to a Northern Electric generator, has been installed.

The foundry of William Bayley & Sons, Milwaukee, Wis., is to be sold at public auction May 11. The plant is appraised at \$115,000.

The receiver of the Montpelier Foundry & Furnace Company, Bryan, Ohio, has sold the property for \$8750 to the Wingert Foundry & Furnace Company, which was recently organized with a capital stock of \$10,000 by W. S. Boon, H. L. Wingert and others.

The Crookston Mfg. Company, Crookston, Minn., has been incorporated, with a capital stock of \$50,000, and will engage in the manufacture of farm implements, castings and general job work. A. O. Espe is president; Helmer Ogard, vice-president and treasurer, and J. I. Daughenbaugh, secretary.

The Phoenix Foundry & Machine Company, St. Joseph, Mo., has been incorporated, with a capital stock of \$25,000, by Wilhelm Blum, Robert Blum, Henry Blum and Roy Blum.

Bridges and Buildings.

The Cowing Engineering Company, Cleveland, Ohio, has secured the contract for a lift bridge with a 70-ft. span to be built across the Oswego River at Syracuse, N. Y.

Motors and Small Engines.

The Fowler Company, Oil City, Pa., has incorporated with \$20,000 capital stock, to manufacture gasoline, electric and other engines. The directors are William M. Moland, William B. James, Orah Smith, Edgar C. Moland and Clarence B. Grunden.

Fires.

The plant of the Amherst Foundry Company, Amherst, N. S., was damaged \$50,000 by fire May 2.

The plant of the Monarch Motor Company, Franklin Park, Ill., was burned May 1, the loss being about \$50,000.

The plant of the Ensley Machine & Foundry Company, Ensley, Ala., was burned last week.

The plant of the Nevada Engineering Works, Reno, Nev., was burned April 26, the loss being about \$6000.

The pattern shop of the James Reilly Repair & Supply Company, Jersey City, N. J., was destroyed by fire May 3, the loss being about \$10,000.

Hardware.

The Des Moines Scale Company, Des Moines, Iowa, will move from its present location on Walnut street to East Sixth and Court avenue, where it will have largely increased quarters.

The Duce Mfg. Company, Kiel, Wis., manufacturer of brass and steel screws and springs, has increased its capital stock from \$10,000 to \$25,000, and will move its plant to Chilton, Wis.

H. W. Cooper, Moline, Ill., manufacturer of saddlery hardware, will incorporate under the name of H. W. Cooper Saddlery Hardware Mfg. Company, with a capital stock of \$200,000. No change is contemplated other than that from private ownership to a corporation.

The business of Clarence Marsh, Rockford, Ill., manufacturer of picture frame machines and miter boxes, has been purchased by Anton S. Ruhl and will be reorganized and incorporated under the name of the H. C. Marsh Mfg. Company.

The F. B. Zieg Mfg. Company, Fredericktown, Ohio, has recently been organized for the manufacture of hardware specialties, chief among which is the Polar ice cream freezer. The machinery equipment for a foundry and machine shop has been purchased, and it is expected that the plant will be ready for operation within a couple of weeks.

The directors of the Capital Lock-Nut & Washer Company, Columbus, Ohio, have under consideration the matter of erecting an addition to the plant. The company's business has grown rapidly and greater capacity is needed.

The new rolling mill of the Penn Shovel Company, Warren, Ohio, has been completed and the company is now rolling steel for the manufacture of shovels. The company will soon be in a position to increase the output of its entire plant.

The Fostoria, Ohio, Board of Trade has accepted the proposition of William Rockhoff, Manitowoc, Wis., for the location of a factory in Fostoria for the manufacture of aluminum specialties. It is the intention to organize a new company with a capital of \$25,000.

The Anderson Tool Company, Anderson, Ind., maker of counter scales, oil tanks, cheese cutters and store appliances, is planning the installation of a steam heating plant in its factory. The new heating system will be completed during the summer months and is designed to heat the buildings of the factory throughout.

The Van Eps Wire & Iron Works, 610 Main street, Peoria, Ill., W. C. Mathews, proprietor, is successor to H. R. Van Eps Wire & Iron Works. The product of the plant is ornamental wire fencing, trellises, hitching posts and iron chairs.

The Bristol Brass Company, Bristol, Conn., is to build an addition to its rolling mill, 75 x 75 ft. and one story.

The E. Ingraham Company, clock manufacturer, Bristol, Conn., is to erect a two-story brick building, 75 x 125 ft., which will be devoted to kiln dry and facilities for planing. The company states that it is not in the market for machinery.

East Bangor Mfg. Company, East Bangor, Pa., has recently been reorganized with increased capital. The com-

pany's facilities for the manufacture of J. P. harness and trace snaps have been enlarged and the capacity of its foundry has also been increased, so that it is in a position to furnish all kinds of castings to the trade.

Hoosier Drill Company, Richmond, Ind., is building an addition to its plant which will enable it to more than double its capacity for 1908.

The Hayden-Corbett Chain Company, Columbus, Ohio, will soon have completed a new link shop. The company is crowded with orders and is badly in need of additional capacity.

Miscellaneous.

I. N. Sullivan, formerly of Springfield, Ohio, inventor of the National smoke consumer, has formed a partnership with H. N. Thomas under the firm name of Thomas & Sullivan, with offices in 709 House Building, Pittsburgh. The company will engage in the furnace building trade and the installation of smoke consumers.

The Auto-Radiator Company, Buffalo, N. Y., has been incorporated with a capital stock of \$100,000, to manufacture radiators for automobiles. C. E. Stafford, Erie, Pa.; C. M. Lyman and R. W. Day, Buffalo, are interested. The location of a factory has not yet been decided upon.

The Clinton Woolen Mills Company, Clinton, Mich., has recently installed a large Eureka water softener and purifier made by the Dodge Mfg. Company, Mishawaka, Ind. This apparatus has a capacity of 264,000 gal. every 24 hours, and is equipped with a storage tank holding 30,000 gal. It is used to supply pure soft water to the mills for textile operations and for boiler feeding.

The large increase in consumption of Portland cement is reflected in the continued expansion of established plants and the building of new ones at different points throughout the country. In addition to the factory now operated at Bay Bridge, Sandusky, Ohio, and Syracuse, Ind., the Sandusky Portland Cement Company, Sandusky, Ohio, is building a plant at Dixon, Ill., which will have a capacity of 2500 bbl. per day. The buildings are constructed of steel and hollow concrete blocks. The factory will be equipped with eight rotary kilns for calcining cement, and will be provided with the usual complement of crushers and tube mills for reducing the limestone and clay materials from which the cement is made. Electrical power transmission will be used throughout the plant, current being generated by three 750-kw. generators, direct connected to cross compound condensing Corliss engines. Contracts for all machinery equipment required for the plant have been placed, and it is expected it will be ready for operation some time in June.

The Diamond Chain Mfg. Company, Indianapolis, Ind., is to erect a new four-story building at a cost of \$30,000 at Senate avenue and Georgia street. This new building is to be used for the manufacture of power transmission chain and will double the capacity.

Owing to the large increase in the business of the Electric Cable Company, an extensive addition is to be made to its plant at Bridgeport, Conn. The new building will be constructed of concrete and brick and will embody the most approved forms of fireproof construction and equipment. The addition will be devoted exclusively to the production of weatherproof wires and cables.

The Union Radiator Company, Johnstown, Pa., has increased its capital stock from \$75,000 to \$100,000.

The Pittsburgh Gage & Supply Company, Pittsburgh, Pa., has increased its capital stock from \$400,000 to \$750,000.

The Brandow Lock Switch Company, Pittsfield, Mass., has begun the manufacture of a combination automobile lock switch, for which a substantial demand has already been created. The company is now having the parts of its product manufactured outside, assembling them at Pittsfield, but it is expected that in the future a factory for their manufacture will be established at Pittsfield.

The Hyde Windlass Company, Bath, Maine, has declared its sixth annual dividend to employees, amounting to \$5000, which was distributed among 225 men.

The Skinner Chuck Company, New Britain, Conn., has filed with the Secretary of State of Connecticut a certificate authorizing an increase in capital stock from \$75,000 to \$225,000. It is understood that a part of this increase will be called in immediately to take care of the increasing volume of business, and the remainder will not be issued until later, it being subject to the call of the directors as the business may require additional capital.

The Standard Metal Mfg. Company, Old Colony Building, Chicago, recently incorporated with a capital stock of \$25,000, is manufacturing car journal bearings of special composition metal under the trademark of S. T. B. It is claimed that this metal, while comparatively cheap, gives excellent results in friction economy and durability.

The Seattle Frog & Switch Company, 901-905 Lowman Building, Seattle, Wash., dealer in railroad material, machinery and pig iron, has incorporated with a capital stock of \$20,000, the incorporators being M. J. Henehan and James McDonough. Mr. Henehan is well known to the iron and steel trade, having

been for many years connected with Rogers-Brown & Co. in New York and New England, and later on the Pacific Coast. Mr. McDonough was formerly master mechanic on the Rock Island Railroad at Chickasha, Okla.

The Leetonia Tool Company, Leetonia, Ohio, has been organized with a capital stock of \$10,000 and will erect a plant for the manufacture of miners' tools.

Plans are being prepared by the Reinforced Concrete Pipe Company, Los Angeles, Cal., for the building of a plant to manufacture steel reinforcements and forms for concrete pipe. About \$50,000 will be expended for this purpose and contracts for all machinery equipment have been let.

The Jewett Car Company, Newark, Ohio, has commenced the construction of an erecting building, 97 x 250 ft. The company will materially increase its force of employees when it is completed.

The Browning Engineering Company.

The Browning Engineering Company, Cleveland, Ohio, making a specialty of the building of locomotive cranes, is increasing its capital stock from \$500,000 to \$850,000. Of this increase \$250,000 is 7 per cent. preferred cumulative stock. The company started in the business of designing and building hoisting machinery in 1900 with only a drafting room, subletting its work to various machine shops in and about Cleveland. As business grew, the company found it necessary to have its own shop, so that a tract of land of 17½ acres was obtained in Collinwood and Nottingham, suburbs of Cleveland, adjoining the Lake Shore & Michigan Southern's new shop. A plant was built comprising 12 buildings, all nearly fireproof, of various sizes, having a floor space of 75,000 sq. ft. and all connected by narrow gauge shop tracks. The plant was laid out for general engineering purposes, but in 1901 it became apparent to the company that the locomotive crane was a specialty upon which it could well afford to concentrate its energies. The business has doubled each year, and in 1906 the income derived from locomotive cranes alone exceeded \$725,000. The output for 1907 is expected to amount to \$1,250,000. To meet the large business of this year it was necessary to secure additional means of production, and accordingly the management contracted for the entire output of the Mansfield Engineering Company, Mansfield, Ohio, and the American Foundry & Machine Company, Ravenna, Ohio. The company manufactures stock machines of sizes and types found to be in demand, thus being enabled to make many economies in manufacturing, as the whole shop practice is brought down to a minimum cost and a maximum production.

Self-Registering Electric Targets.

During recent target practice at Bisely, England, self-registering electric targets were exhibited. The apparatus was designed to mark a 4-ft. target used in competition at a range of 200 yd. The target consists of a plate of solid ½-in. steel, carried on four hinged brackets supported by a frame bolted to a foundation platform of heavy timber. The front of the main frame carries a milled steel plate ½ in. thick, forming a carrier for the recording hammers, which number 61 for the 4-ft. target and 173 for the 6-ft. target used for greater ranges. The plate is pierced by a series of oblong holes, through which the ends of the hammers project. The hammers are supported on pins, and, due to their weight, rest against the target plate. When thrown backward by a hit they make contact with brass plates, each thus closing a circuit, which drops a shutter on the announcement board. The distance between the hammer plate and the target plate can be varied to correspond to various service charges or different ranges. It is so made that a hammer will be thrown whenever a bullet strikes within a 3-in. circle of the point of contact of the hammer with the target. When a bullet strikes the target plate, if directly over the hammer, it throws this up and completes the circuit. If midway between two hammers it will throw both, thus indicating the position struck; or it may throw three or more. In any case, the corresponding drops at the indicating board will give an accurate register of the point struck.

The Iron and Metal Trades.

There has been a notable resumption of work on the part of the blast furnaces, a net gain of 10 stacks being recorded in the monthly blast furnace statistics collected by *The Iron Age*. The result is that on May 1st there were in operation 323 anthracite and coke furnaces with a weekly capacity of 523,912 tons, which is the record thus far for this country, and compares with 497,456 tons on April 1st. The output for April, a short month, was 2,216,558 tons, or at the rate of 73,885 tons daily, as compared with 2,226,457 tons in March, or 71,821 tons daily.

Three large furnaces have gone in during the first few days of May, which will add about 6000 tons per week to the capacity.

It is a noteworthy fact, however, that the increase in output and in capacity is almost entirely due to the steel works furnaces. These made in April 1,446,788 tons as compared with 1,424,827 tons in March, leaving 769,770 tons and 801,630 tons respectively for the merchant furnaces. This is an actual decline from 25,860 tons daily in March to 25,659 tons daily in April.

The Foundry Iron markets are firmer throughout the country. The makers generally have either withdrawn from the market, notably in the South and in the Central West and the districts along the lakes, or are confining sales to practically the last quarter. Much is said about the large sales during the last few weeks which have brought about this condition, but there has been unusual reticence all along as to details.

At tidewater points and to a considerable distance into the interior the advance in the price of foreign Iron has had a sympathetic effect, the higher prices abroad being chiefly attributed to buying from Germany.

There has been some movement in Basic Iron in the East, sales during the week aggregating between 35,000 and 40,000 tons, of which eastern Pennsylvania took about 30,000 tons, the largest transactions involving 17,000 and 10,000 tons, respectively. The balance was taken by local and New England works. By far the greater part of these purchases were for the third quarter, the prevailing price being \$23.25, delivered. The Steel makers claim that even these purchases are largely in anticipation of sales of their own products, the prices for which do not justify the prevailing prices for Basic Pig Iron.

Reports of the purchases by the leading interest of Steel Billets from Eastern Steel makers have been greatly exaggerated. They probably did not exceed 10,000 tons, but still they are significant as reflecting the scarcity of Steel in the Central West.

The railroads do not seem to be taking hold very vigorously in their Rail purchases for delivery in 1908. So far as can be learned nothing has been closed. One inquiry for 50,000 tons has come up in Chicago, and the Harriman lines are making inquiries, coupled with the statement that only Open Hearth Rails will be considered.

Structural shops have taken comparatively little business during the past week. The 15,000 tons required for a floating dry dock for this city will interest Plate makers more particularly. They, too, are concerned in a Riveted Pipe line for the Rocky Mountains, which calls for about 38,000 tons of material.

Agricultural implement makers have been buying Bars more liberally during the past week. The condition of the Sheet and Tin Plate trades is indicated by the fact that the Steel Corporation has all of its Sheet mills and 91 per cent. of its Tin Plate mills in operation.

As yet no announcement has been made by the National Tube Company in regard to prices after June 1.

The report that a lot of 26,000 tons of Bars had been sold for export is officially denied.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 8, 1907.	May 1, 1907.	Apr. 10, 1907.	May 9, 1906.
FIG IRON. Per Gross ton:				
Foundry No. 2, Standard, Philadelphia.....	\$25.50	\$24.50	\$24.50	\$18.50
Foundry No. 2, Southern, Cincinnati.....	24.25	24.25	24.75	16.75
Foundry No. 2, Local, Chicago.....	26.50	26.50	26.00	18.50
Bessemer, Pittsburgh.....	23.85	23.85	23.35	18.10
Gray Forge, Pittsburgh.....	22.35	21.85	21.60	16.50
Lake Superior Charcoal, Chicago.....	27.50	27.00	26.50	19.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh.....	30.50	30.50	30.00	27.00
Open Hearth Billets, Phila.....	32.50	?	?	?
Wire Rods, Pittsburgh.....	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill.....	28.00	28.00	28.00	28.00
OLD MATERIAL. Per Gross ton:				
Steel Rails, Melting, Chicago.....	18.00	18.00	18.50	14.00
Steel Rails, Melting, Phila.....	19.50	19.25	18.75	16.50
Iron Rails, Chicago.....	24.50	24.50	25.00	21.25
Iron Rails, Philadelphia.....	27.25	27.25	27.00	21.00
Car Wheels, Chicago.....	25.00	25.00	25.00	19.00
Car Wheels, Philadelphia.....	24.00	24.00	24.00	16.75
Heavy Steel Scrap, Pittsburgh.....	18.00	18.00	18.00	15.00
Heavy Steel Scrap, Chicago.....	15.50	15.50	16.00	13.50
Heavy Steel Scrap, Philadelphia.....	19.00	18.75	18.50	16.25

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia.....	1.83½	1.83½	1.93½	1.63½
Common Iron Bars, Chicago.....	1.76½	1.76½	1.81½	1.66½
Common Iron Bars, Pittsburgh.....	1.80	1.80	1.80	1.50
Steel Bars, Tidewater, New York.....	1.84½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh.....	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York.....	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Beams, Tidewater, New York.....	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh.....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York.....	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh.....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh.....	1.85	1.85	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh.....	1.90	1.90	2.00	1.60

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh.....	2.50	2.50	2.50	2.25
Wire Nails, Pittsburgh.....	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh.....	2.05	2.05	2.05	1.80
Barb Wire, Galv., Pittsburgh.....	2.45	2.45	2.45	2.30

METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
*Lake Copper, New York.....	24.87½	25.00	24.50	18.62½
Spelter, New York.....	6.55	6.60	6.85	6.00
Spelter, St. Louis.....	6.49	6.45	6.65	5.90
Lead, New York.....	6.00	6.10	6.15	5.87½
Lead, St. Louis.....	5.92½	5.92½	5.95	5.72½
Tin, New York.....	42.25	43.05	40.85	43.50
Antimony, Hallett, New York.....	20.50	21.00	22.25	24.50
Nickel, New York.....	45.00	45.00	45.00	40.00
Tin Plate, 100 lb., New York.....	\$4.09	\$4.09	\$4.09	\$3.79

* Waterbury average for January, 1907, 25.25c.; February, 25.75c.; March, 26c.; April, 26c.

Chicago.

FISHER BUILDING, May 8, 1907.—(By Telegraph.)

Buying for 1908 requirements by the railroads is light. No new sales are reported, but there are inquiries from Western roads for 55,000 tons of Standard Section Rails covering deliveries for that period. Figures are being asked on material for two large riveted Pipe lines, the combined tonnage of which would run close to 40,000. These inquiries come from Rocky Mountain territory and are presumed to represent undeveloped plans. In finished material orders for forward delivery are in most lines not coming forward as freely as heretofore, but specifications on existing contracts are furnished without stint and the pressure for deliveries on delayed shipments is strong and persistent. The amount of mill tonnage booked is unprecedented. It is stated that the Republic Iron & Steel Company now has orders for 100,000 tons more than at any time in its history. Business in Structural Shapes shows remarkable strength and the prospective tonnage is large. The Pig Iron market, although quieter in point of business moving, is strong, prices on forward deliveries showing an upward tendency. Spot prices are a little softer because of the diminished demand for prompt Iron. The new furnace at Mayville, Wis., was blown in last week, but the old stack now out for relining will not be ready for service for 30 to 60 days.

Pig Iron.—The spurt of buying noted in last week's report was of short duration. The market is this week distinctly quieter. Prices for last half tonnage are firm and stronger, one Southern furnace having advanced to \$20, Birmingham, for the fourth quarter. While the amount of

tonnage placed during the buying of a week ago was considerable it was nothing like as large as that involved in the notable buying movements of earlier months. Very little business is being done in spot Iron, most of the inquiries and orders received being for third and fourth quarter requirements. The Sloss-Sheffield Steel & Iron Company has withdrawn from the market on all deliveries, except fourth quarter. This withdrawal may be interpreted to mean fully completed schedules for prior periods, or merely the reservation of unsold tonnage, according to the view taken. Though there is much talk of the available furnace output being insufficient to supply melters' demands, buyers are proceeding with conservative caution in placing contracts. The fact that a respectable tonnage of resale Iron has been offered by melters in the market at prices below present furnace quotations indicates that some consumers are not convinced of the permanency of present prices. It seems certain, however, that if the melt for the remaining portion of the year continues at the present rate, there will at least be no surplus of furnace production. Last week's sales included several fair tonnage lots of Malleable Bessemer, some of which was taken by implement makers, and an inquiry for 5000 tons is now in the market. Iron for spot shipment is now offered at \$22.50 for No. 2 Foundry, Birmingham, \$21 for the third quarter and \$19.50 for the fourth quarter, which are the lowest prices quoted. Northern furnaces are closely sold up, the amount of tonnage offered for delivery this year being limited to a few thousand tons. For what is offered \$24.50 to \$25 is asked for last half, and \$27 for prompt delivery, Chicago. Virginia Irons are quoted for May and June delivery at \$25, at furnace, \$23 for third quarter and \$22 for fourth quarter. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal.....	\$27.50 to \$28.00
Northern Coke Foundry, No. 1.....	27.00 to 27.50
Northern Coke Foundry, No. 2.....	26.50 to 27.00
Northern Coke Foundry, No. 3.....	26.00 to 26.50
Northern Scotch, No. 1.....	27.00 to 27.50
Ohio Strong Softeners, No. 1.....	26.50 to 27.00
Ohio Strong Softeners, No. 2.....	26.00 to 26.50
Southern Coke, No. 1.....	26.85 to 27.35
Southern Coke, No. 2.....	26.35 to 26.85
Southern Coke, No. 3.....	25.85 to 26.35
Southern Coke, No. 4.....	25.35 to 25.85
Southern Coke, No. 1 Soft.....	26.85 to 27.35
Southern Coke, No. 2 Soft.....	26.35 to 26.85
Southern Gray Forge.....	24.85 to 25.35
Southern Mottled.....	24.85 to 25.35
Malleable Bessemer.....	26.50 to 27.00
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 7/8.....	31.30 to 31.80
Jackson Co. and Kentucky Silvery, 8.....	32.30 to 32.80
Jackson Co. and Kentucky Silvery, 10.....	33.30 to 33.80

(By Mail.)

Billets and Rods.—The marked scarcity of Rods limits transactions to small lots, \$37 to \$38, Pittsburgh, being asked for current orders for present delivery. A desultory trade, comprising scattered carload and light tonnage orders, continues to represent the movement in Forging Billets. No change in prices is reported, which are quoted at \$38, Chicago, and upward, according to size.

Rails and Track Supplies.—Inquiries for two lots of standard Section Rails, aggregating 55,000 tons, from two Western roads are in the market, one being for 50,000 and the other 5000 tons. An inquiry for 4000 tons for 1907 requirements is also reported. Quite a good inquiry has developed for Light Rails, but Western mills are not in position to book business of this kind, save for distant delivery, and the principal producers are sold up for 1907. Spikes are in good demand. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.35c. to 2.45c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$35; 25-lb., \$36; 20-lb., \$37; 16-lb., \$38; 12-lb., \$39, f.o.b. mill. Standard Sections \$28, f.o.b. mill, full freight to destination.

Structural Material.—Instead of receding, the demand for Structural Shapes is growing stronger. The American Tobacco Company is now considering the prosecution of its plans for a new building requiring 3200 tons, which were for a time held up. Quite a number of small contracts have been closed, though none of notable tonnage is reported. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices, at Chicago, are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86 1/2c.; Angles, 3 to 6 in., 1/4-in. and heavier, 1.86 1/2c.; larger than 6 in. on one or both legs, 1.96 1/2c.; Beams, larger than 15 in., 1.96 1/2c.; Zees, 3 in. and over, 1.86 1/2c.; Tees, 3 in. and over, 1.91 1/2c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—While there is less new business coming forward, the principal mills have orders and specifications that will engage practically their entire rolling capacity for the remainder of the year. There are, however, inquiries in the market, of a tentative nature, that foreshadow large requirements for Western enterprises. One of these involves the building of an 84-in. hydraulic pipe line, for the con-

struction of which 38,000 tons of 1-in. and 1 1/4-in. Plates will be required. Inquiries have also been received from the Telluride Power Company of Idaho for 14 miles of 30-in. pipe, to be built of No. 8 Steel. We quote for future delivery as follows: Tank Plate, 1/4-in. and heavier, wider than 6 1/4 and up to 100 in. wide, inclusive, car lots, Chicago, 1.86 1/2c. to 2.06 1/2c.; 3-16 in., 1.96 1/2c. to 2.16 1/2c.; Nos. 7 and 8 gauge, 2.01 1/2c. to 2.21 1/2c.; No. 9, 2.11 1/2c. to 2.31 1/2c.; Flange quality, in widths up to 100 in., 1.96 1/2c. to 2.06 1/2c., base, for 1/4-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.96 1/2c. to 2.16 1/2c.; Flange quality, 2.06 1/2c. Store prices on Plates are as follows: Tank Plate, 1/4-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—The prospect of resumption of prompt shipments is still distant. Little improvement is noticed, and Sheets of all gauges and sizes are scarce. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.01 1/2c.; No. 12, 2.06 1/2c.; No. 14, 2.11 1/2c.; No. 16, 2.21 1/2c.; Box Annealed, Nos. 17 to 21, 2.51 1/2c.; Nos. 22 to 24, 2.56 1/2c.; Nos. 25 and 26, 2.61 1/2c.; No. 27, 2.66 1/2c.; No. 28, 2.76 1/2c.; No. 29, 2.86 1/2c.; No. 30, 2.96 1/2c.; Galvanized Sheets, Nos. 10 to 14, 2.81 1/2c.; Nos. 15 and 16, 3.01 1/2c.; Nos. 17 to 21, 3.16 1/2c.; Nos. 22 to 24, 3.31 1/2c.; Nos. 25 and 26, 3.51 1/2c.; No. 27, 3.71 1/2c.; No. 28, 3.91 1/2c.; No. 30, 4.41 1/2c.; Sheets from store: Blue Annealed, No. 10, 2.50c.; No. 12, 2.55c.; No. 14, 2.60c.; No. 16, 2.70c.; Box Annealed, Nos. 18 to 21, 2.80c.; Nos. 22 to 24, 2.85c.; No. 26, 2.90c.; No. 27, 2.95c.; No. 28, 3.05c.; No. 30, 3.45c.; Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—Quite a number of orders for Steel Bars ranging up to 1000 tons have been placed during the week. Several implement buyers for July to July requirements were represented among the purchasers. Prices are firmly held. Quotations, Chicago, are as follows: Steel Bars, 1.76 1/2c., with half extras; Iron Bars, 1.76 1/2c. to 1.81 1/2c.; Hoops, 2.16 1/2c., extras as per Hoop card; Bands, 1.76 1/2c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86 1/2c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Since the withdrawal of the National Tube Company from the market, outside mills have been overwhelmed with orders. The combined product of the Pipe mills has been insufficient to meet the demand. The consequent scarcity, though it affects all kinds of Pipe, is more pronounced in the smaller sizes of Black and Galvanized. In the absence of official quotations those named are nominal. Mill quotations are approximately as follows: Black Steel Pipe, 3/4 to 5 in., 72.35; Galvanized, 62.35, carload lots, Chicago. From store in small lots, Chicago jobbers quote 70 per cent. on Black Steel Pipe, 3/4 to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—The delay involved in securing shipments from mill has greatly strengthened the demand from store stocks. Mills are still too badly congested to be relied upon for nearby deliveries. Mill quotations for future delivery on the base sizes are as follows: 2 1/2 to 5 in., in carload lots, Steel Tubes, 63.35; Iron, 50.35; Seamless, 49.35; 2 1/2 in. and smaller, and lengths over 18 ft., and 2 1/2 in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1 1/4 in.....	35	35	35
1 1/4 to 2 1/4 in.....	50	35	35
2 1/4 in.....	52 1/2	35	35
2 1/2 to 5 in.....	60	47 1/2	47 1/2
6 in. and larger.....	50	35	..

Merchant Steel.—Orders for Shafting and Smooth Finished Machinery Steel are plentiful, and, though for lots of moderate tonnage, constitute a good business. Locally, the enforcement of the wide tire ordinance has created an unusual demand for heavy sizes of round edge tire. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.96 1/2c.; Iron Finish, up to 1 1/2 x 1/2 in., 1.91 1/2c.; Iron Finish, 1 1/2 x 1/2 in. and larger, 1.76 1/2c., base; Channels for solid rubber Tires, 3/4 to 1 in., 2.26 1/2c., and 1 1/8-in. and larger, 2.16 1/2c.; Smooth Finished Machinery Steel, 2.16 1/2c.; Flat Sleigh Shoe, 1.91 1/2c.; Concave and Convex Sleigh Shoe, 2.06 1/2c.; Cutter Shoe, 2.45c.; Toe Calk Steel, 2.31 1/2c.; Railroad Spring, 1.96 1/2c.; Crucible Tool Steel, 6 1/2c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—Contracts were let last week for 6000 tons by the city of St. Louis; 2500 tons by the Cincinnati Water Company, and a year's requirements, amounting to about 3000 tons, by the Cincinnati Gas Company, which were taken by the United States Cast Iron Pipe & Foundry Company. The city of Columbus, Ohio, will receive bids up

to May 9 on 600 tons. Lettings have been held and contracts placed for a number of lots ranging from 100 to 500 tons. The volume of business moving is on the whole satisfactory. We quote per net ton, Chicago, as follows: Water Pipe, 4 in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

Coke.—Connellsville 72-hr. Foundry Coke for prompt shipment is easier, \$3 to \$3.25 at the oven being quoted. For last half contracts from \$3.25 to \$3.50 is asked.

Old Material.—The Scrap Iron market is sluggish and inactive in all grades. Its state of equilibrium is unstable, and might be easily tipped either way by an impulse given by either the buying or selling side. Rolling mills are buying conservatively, and dealers are not pressing sales. Cast Scrap has a slightly weaker tendency, due to lighter demand from melters; but for the upward tendency of Pig Iron prices would doubtless react sharply. The following quotations are per gross ton, f.o.b. Chicago:

Old Iron Rails.....	\$24.50 to \$25.00
Old Steel Rails, rerolling.....	18.50 to 19.00
Old Steel Rails, less than 3 ft.....	18.00 to 18.50
Relaying Rails, standard sections, subject to inspection.....	28.00 to 30.00
Old Car Wheels.....	25.00 to 25.50
Heavy Melting Steel Scrap, cut apart.....	15.50 to 16.00
Frogs, Switches and Guards.....	16.50 to 17.00
Mixed Steel.....	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates.....	\$19.50 to \$20.50
Iron Car Axles.....	26.50 to 27.00
Steel Car Axles.....	21.00 to 21.50
No. 1 Railroad Wrought.....	15.25 to 15.75
No. 2 Railroad Wrought.....	14.25 to 14.75
Railway Springs.....	15.00 to 15.50
Locomotive Tires, smooth.....	17.00 to 17.50
No. 1 Dealers' Forge.....	12.50 to 13.00
Mixed Busheling.....	11.50 to 12.00
Iron Axle Turnings.....	11.50 to 12.00
Soft Steel Axle Turnings.....	11.50 to 12.00
Machine Shop Turnings.....	11.50 to 12.00
Cast Borings.....	9.50 to 10.00
Mixed Borings, &c.....	9.50 to 10.00
No. 1 Mill.....	10.00 to 10.50
No. 2 Mill.....	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings.....	11.50 to 12.00
No. 1 Cast Scrap.....	18.50 to 19.00
Stove Plate and Light Cast Scrap.....	15.00 to 15.50
Railroad Malleable.....	16.00 to 16.50
Agricultural Malleable.....	15.00 to 15.50
Pipe and Flues.....	15.00 to 15.50

Metals.—Weakness in Copper reported elsewhere is not reflected in prices quoted for this market. A fair business is reported, though buying is largely confined to immediate needs. We quote as follows: Casting Copper, 25½¢. to 26¢.; Lake, 26¢. to 26½¢., in car lots for prompt shipment; small lots, ¼¢. to ¾¢. higher; Pig Tin, car lots, 44½¢.; small lots, 45¢.; Lead, Desilverized, 6.50¢. to 6.60¢., for 50-ton lots; Corroding, 7.25¢. to 7.35¢., for 50-ton lots; in car lots, 2¼¢. per 100 lb. higher; Spelter, 7.15¢.; Cookson's Antimony, 27½¢., and other grades, 26½¢. to 27¢.; Sheet Zinc is \$8.60 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 22¢.; Heavy Copper Wire, 21¢.; Copper Bottoms, 20¢.; Copper Clips, 20½¢.; Red Brass, 20¢.; Red Brass Borings, 19¢.; Yellow Brass, 17½¢.; Yellow Brass Borings, 16¢.; Light Brass, 13¢.; Lead Pipe, 6¢.; Tea Lead, 5½¢.; Zinc, 5½¢.; Pewter, No. 1, 30¢.; Tin Foil, 37¢.; Block Tin Pipe, 40¢.

Theodore Geissmann & Co., mill representatives and wholesale dealers in Iron and Steel and Wire, have removed from 115 Dearborn street to the Commercial National Bank Building, Adams and Clark streets, Chicago, where more commodious quarters have been secured.

Birmingham.

BIRMINGHAM, ALA., May 5, 1907.

Pig Iron.—The Iron market continues at fever heat, with those who have not covered for last half requirements endeavoring to get in and the producers reluctant to take on additional business. The Tennessee and Republic companies are out of the market for the year, and the Sloss-Sheffield Steel & Iron Company is booking orders for only fourth quarter delivery. The smaller producers have practically withdrawn for all deliveries except the last quarter, preferring to reserve the unsold part of their product to sell as spot Iron, rather than let it go on contracts at prices at present prevailing. The total sales for April by the furnaces in this district amounted to about 125,000 tons, the larger part of which was placed during the last two weeks of the month, and sales so far in May are keeping up the pace set by April. Spot Iron appears to be in less demand, but enough business is being done to hold the price firm at \$23. On orders for delivery during May and June \$22 to \$22.50 is the ruling price. Third quarter Iron is only being offered by one or two concerns, and the price asked is from \$20.50 to \$21. For fourth quarter the price asked the fore part of the week was \$19, which was advanced to \$19.50, and for the past two days makers have been selling readily at \$20. A slight increase in production may be expected in the near future,

but owing to the scarcity of labor it will be impossible to secure a sufficient supply of raw material to operate any large number of furnaces in addition to those now in blast. The No. 1 furnace of the Tennessee Company at Bessemer, which has been undergoing extensive repairs, will be blown in within the next few days, and it is expected that the No. 2 furnace at the same place will be placed in commission before the end of the present month. The new furnace of the Alabama Consolidated Coal & Iron Company at Gadsden, which has been in course of construction for more than a year, is nearing completion and it is expected will soon be in blast. The Birmingham Iron Company has been unable to secure deliveries on much of the material required for the furnace it is building, and which it was expected would be completed by the middle of the year. It is therefore not thought that this stack will be in blast before late in the fall, if then.

Cast Iron Pipe.—Among the lettings in the near future are 2500 tons for Seattle, Wash., and 2000 to 3000 tons for Carthage, N. Y. Several Southern cities will shortly be in the market, but dates and tonnage required have not yet been announced. The demand for small tonnage continues heavy, and the present healthy condition of the Pipe market will doubtless continue throughout the year. Quotations on Water Pipe are as follows per net ton: 4 to 6 in., \$36; 8 to 12 in., \$34; over 12 in., average \$31, with Gas Pipe \$1 extra per ton.

Old Material.—There is perhaps a slightly less demand for Heavy Melting Scrap now than during the past several weeks, due no doubt to the fact that deliveries of Pig Iron are secured with more regularity, thus relieving the necessity of so much Scrap in mixtures. Wrought continues in little demand. Dealers' quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	16.50 to 17.00
Old Car Wheels.....	20.50 to 21.00
No. 1 Railroad Wrought.....	18.50 to 19.00
No. 2 Railroad Wrought.....	13.00 to 13.50
No. 1 Country Wrought.....	13.00 to 13.50
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipe and Flues.....	13.50 to 14.00
Railroad Malleable.....	13.00 to 13.50
No. 1 Steel.....	14.00 to 14.50
No. 1 Machinery Cast.....	16.50 to 17.00
Stove Plate and Light Cast.....	12.50 to 13.00
Cast Borings.....	8.50 to 9.00

Philadelphia.

PHILADELPHIA, PA., May 7, 1907.

The outcome of the week's business has been a further stiffening in the prices of Pig Iron. The tonnage changing hands is not unusually large, for the reason that makers have little or nothing to offer for early delivery and are by no means inclined to push sales for later dates. Consumers are confronted with the fact that if they are to get Iron at all they must pay the full rates of last week or a little more. The most notable advance is in foreign Iron. Middle-brough No. 3, which sold as low as \$20.50 not many days ago, is now quoted at \$22 to \$22.50, and Scotch Iron at \$24.50 to \$25. These Irons are virtually spot lots, or, at any rate, from that to within 30 to 45 days, hence the rather sudden increase in values. American Irons vary according to circumstances, but there is no doubt that an all-round advance of at least 50¢. per ton has been established since the opening of the month. Prospects for better supplies give no encouragement to buyers to hold off for easier terms, and with a great many it is a matter of debate to decide to what extent they should place orders for forward delivery. A few seem inclined to take their chances and buy conservatively, but there is a gradual switching over to the idea that it is not advisable to wait much longer before renewing expiring contracts. Makers of Pig Iron claim that contracts made six or eight months ago are beginning to run out and that new purchases will be a necessity in the near future. This, of course, is all right, but it can hardly be regarded as a new bull card, which some appear to think it is, simply because the obligation to deliver carries with it the necessity for new business, and if the consumer must buy, the producer must sell. It may, therefore, be regarded more in the light of a readjustment in values on new deliveries than as so much entirely new business. The prices at which these renewals will be made depend in a measure upon the prices realized on expiring contracts. Those who have had extremely low figures during the past six months cannot expect to be favored to the same extent as those who were less fortunate and had to pay \$2 to \$4 a ton more for current deliveries than some of the competitors. The point will be, therefore, to adjust values in proportion to new and changed conditions in each particular case.

Pig Iron.—Prices are too irregular and too unsettled to be given with exactness, varying as they do according to the circumstances in each individual case. Spot Iron is scarcer than ever, and premiums of varying proportions are quoted for such deliveries. A good deal of the business is now for

deliveries during the last half of the year, which for No. 2 X Foundry may be said to range from \$24 to \$25. Foreign Iron is getting scarcer, and is easily \$1 dearer than on the date of our last report, and with the further exhaustion of stocks in Great Britain it is not unlikely that we shall have to cease drawing from that source, or pay still higher figures, which, of course, would have a corresponding effect on American Irons. The demand for Steel making Irons is not extraordinarily heavy, but it is well understood that old contracts have been greatly reduced, and it is a question between buyer and seller as to how soon they will renew and what figures may be paid for renewals. Consumers regard the asking prices as out of proportion with the prices of finished products, and are therefore most unwilling to renew contracts at the prices which makers seem to think they are entitled to. On the other hand, Pig Iron is so scarce that producers cannot see why they should be called upon to reduce their figures. Some of the furnaces that have been making Basic are considering whether it would not pay them better to make Foundry Iron, which brings relatively higher prices than those ruling for Basic. Some purchases have been made by local Steel making concerns during the past few days, but not enough to give any clear idea of what will be agreed upon when renewals are made for deliveries during the last quarter. Third quarter deliveries are pretty well established at about \$24 to \$24.50, although \$23 to \$23.50 might possibly be done for the last quarter, but the test will be made when the large buyers definitely decide in regard to their position marketwise. To say that the market is strong faintly defines the situation, and it is an open question whether sellers are prepared to make such concessions as will enable consumers to come into the market freely. This will no doubt be determined in the near future. In the meanwhile prices for deliveries in this territory for the various dates are about as follows:

May and June Deliveries.

No. 2 X Foundry.....	\$25.50 to \$26.50
Gray Forge.....	22.75 to 23.25
Basic.....	24.75 to 25.25
Middlesbrough No. 3.....	22.00 to 22.50
Scotch Iron.....	24.50 to 25.00

Third Quarter 1907.

No. 2 X Foundry.....	\$24.50 to \$25.00
Gray Forge.....	22.50 to 22.75
Basic.....	23.75 to 24.25
Low Phosphorus.....	27.25 to 27.50

Fourth Quarter 1907.

No. 2 X Foundry.....	\$23.25 to \$23.75
Basic.....	23.00 to 23.50
Gray Forge.....	22.00 to 22.50

Ferroalloys.—Business has been rather quiet the past few days, but prices are steady at about \$68 for prompt shipment and \$66 for shipment during the last half of the year.

Steel.—The demand is fairly active for ordinary Rolling Billets at about prices quoted last week—namely, \$32.50 to \$33, delivered. Forging Steel is in very good demand and commands \$37 to \$38 for deliveries in local territory.

Plates.—The demand is not quite as urgent as it was some time ago, and prices are a little inclined to shade off on prospects of first-class business. Specifications are fair, but there is evidently not the rush that there was some time ago. Quotations for local deliveries are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.93½	1.98½
Flange or Boiler Steel.....	2.03½	2.08½
Marine.....	2.23½	2.28½
Locomotive Firebox Steel.....	2.43½	2.48½

Structural Material.—Business is somewhat unsettled by the possibility of strikes in the building trade, although the mills are in most cases well employed. There are some indications that the mills are running closer to the end of their order books than they were some time ago, so that while prices are about the same they are regarded as somewhat unsettled, and probably will remain so until something definite is known in regard to the strikes. Meanwhile quotation are 1.83½c. to 2c. for Beams, Angles and Channels, according to specification.

Bars.—The demand for Bars is only fair, and in some cases lower quotations are said to have been made, but in most cases there was some doubt in regard to quality, as well as the inability to supply a full list of sizes. The leading mills get their price, say 1.83½c., and are fully employed, but the feeling is a little unsettled. Steel Bars for prompt shipment command about the same figures as for Refined Iron, although for deferred deliveries 1.73½c. to 1.78½c. might possibly be done for a first-class order.

Sheets.—The demand is very satisfactory, and mills have all the business they can handle, so that prices remain firm at last week's quotations, which for mill shipments are as follows, subject to the usual advance on small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—Prices are very strong all the way through and everything on the list commands the full prices

of last week, and in some lines higher prices are paid for prompt shipments. It is difficult to give very close quotations, but the range for deliveries in buyers' yards in this district would be about as follows:

Steel Crops and Rails.....	\$19.50 to \$20.00
No. 1 Steel Scrap.....	19.00 to 19.50
Low Phosphorus.....	24.00 to 25.00
Old Steel Axles.....	21.75 to 22.25
Old Iron Axles.....	30.50 to 31.50
Old Iron Rails.....	27.25 to 27.50
Old Car Wheels.....	24.00 to 25.00
Choice No. 1 R. R. Wrought.....	20.50 to 21.00
No. 1 Yard Scrap.....	19.00 to 19.50
Long and Short.....	18.50 to 19.00
Machinery Scrap.....	21.00 to 21.50
Wrought Iron Pipe.....	17.00 to 17.50
No. 1 Forge Fire Scrap.....	16.50 to 17.00
No. 2 Light.....	12.00 to 12.50
Wrought Turnings.....	17.00 to 17.50
Axle Turnings.....	17.00 to 17.25
Stove Plate.....	17.75 to 18.25
Cast Borings.....	16.00 to 16.25
Grate Bars.....	16.50 to 17.00

Pittsburgh.

PARK BUILDING, May 8, 1907.—(By Telegraph.)

Pig Iron.—The total sales of Bessemer and Basic Pig Iron in lots of 1000 tons and over by the Bessemer Pig Iron Association and W. P. Snyder & Co., made in April, amounted to 235,500 tons, of which about 150,000 tons was bought by the Youngstown Sheet & Tube Company, the other tonnage being divided among the Cambria Steel Company, Sharon Steel Hoop Company, Marshall Foundry Company and other leading consumers. The average price of this Iron was \$21.36 at Valley furnace, or \$22.21, Pittsburgh. This price will be used for determining the basis of a large number of contracts for Pig Iron, Coke, Steel Plates, Ingot Molds and other products which are sold on a sliding scale basis. There is a good deal of inquiry for Bessemer and Basic Iron, mostly from Steel foundries and Open Hearth plants which have not covered their requirements for the last half of the year and who now find they are up against a very strong Pig Iron market and a very limited supply. Some of the dealers have small lots of Basic and Bessemer Iron, notably Basic, which they are offering at lower prices than would be accepted by the furnaces, and we note sales of 6000 to 7000 tons of Basic to two Open Hearth Steel plants for last half of the year delivery, on the basis of about \$22.25, Valley furnace. Very little Iron could be had at this price, however, as most sellers quote \$23 for both Bessemer and Basic. We quote Bessemer Iron for last half of the year delivery at \$23, and Basic at \$22.50 to \$23, Valley furnace. A sale of 7500 tons of Basic and one of 600 tons of Bessemer are reported on the basis of about \$23, Valley furnace, for second half of the year delivery. There is some inquiry for Foundry Iron, and we note a sale of 3000 tons of Northern No. 2 at \$22, Valley furnace, and 3000 tons of Virginia Foundry at \$21, at furnace, or \$23.80, Pittsburgh, this Iron being for second half of the year delivery; also a sale of 100 tons of Northern No. 2 Foundry for prompt shipment at \$25, Valley furnace. We quote Northern No. 2 Foundry for spot shipment at \$25 to \$26, for third quarter \$24, and for last half of the year about \$23, at Valley furnace, but note that several furnaces that can make prompt delivery are asking slightly higher prices. There is also some inquiry for Forge Iron and prices are higher, the absolute minimum of the market being \$22 for last half, with sales reported at \$22.15, at furnace, or \$23, Pittsburgh. A sale of 2000 tons is reported at the latter price for last half of the year delivery.

Steel.—The available supply of Billets and Sheet and Tin Bars does not seem to be increasing, deliveries still being very hard to obtain. We quote Bessemer Billets at \$30.50 to \$31, and Open Hearth Billets at \$31.50 to \$32, Pittsburgh. Sheet and Tin Bars in random lengths are held at \$30.50 to \$31, maker's mill, Pittsburgh or Youngstown.

(By Mail)

Ferromanganese.—There has been a decided drop in prices of Ferro, and for prompt delivery English 80 per cent. for June delivery is offered as low as \$68, Pittsburgh, and we can report a sale of 100 to 125 tons at that price. It is probable that for last half of the year delivery \$61, Baltimore, or \$63 Pittsburgh, could be done on large tonnage.

Skelp.—The mills are filled for the next three or four months, and early deliveries are hard to obtain. There has been a large tonnage of both Grooved and Sheared Iron Skelp sold for third quarter delivery on the basis of about 2.25c. or higher, Pittsburgh. For forward delivery we quote: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.90c. to 1.95c.; Grooved Iron Skelp, 2.20c. to 2.25c.; Sheared Iron Skelp, 2.30c. to 2.35c.

Steel Rails.—Last week the Carnegie Steel Company took orders for about 3000 tons of Light Rails. Postponements of deliveries of Rails by the railroads have not been serious, and the tonnage thus deferred will enable the mills to make better deliveries on other contracts. We quote Light

Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

Structural Material.—The American Bridge Company has taken about 4000 tons of bridge work for the Illinois Central, and the McClintic-Marshall Construction Company has taken 1300 tons of bridge work for another road, and has also taken the entire contract for the new foundry, blacksmith shop and power house to be built by the Union Switch & Signal Company, at Swissvale, in which about 1000 tons of Steel will be used. The McClintic-Marshall Company is acting as general contractor for all this work, the total amount of the contract being about \$225,000. Quite an active inquiry for Structural work is coming from nearly all parts of the country, and a great deal of large work is in sight. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x 1/4 in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 1/2 in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—Premiums continue to be freely paid by consumers for prompt deliveries, some of the smaller mills being in position to take advantage of this situation and make deliveries in two to three weeks. The larger Plate mills are sold up for months ahead and are turning down tonnage almost every day, being unable to make deliveries wanted by customers. For forward delivery we quote Tank Plate, 1/4-in. thick, 6 1/4 in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than 1/4-in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of 1/2 of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—On Monday, May 6, the American Sheet & Tin Plate Company had 100 per cent. of its Sheet capacity in operation, this including six new hot mills at Vandergrift which have started, giving that works a total of 35 hot mills and two more building, which will be ready in a week or 10 days. The company cannot promise deliveries on Black or Galvanized Sheets inside of four or five months and is turning down orders carrying good premiums in prices, being unable to make the deliveries wanted. Consumers who need Sheets promptly are compelled to pay \$2 to \$3 a ton premium over official prices and are often unable to get deliveries even under these conditions. The supply of Sheet Bars to independent mills that buy in the open market does not seem to be any better. Regular prices for forward shipment are as follows: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No 28 gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—A moderate amount of new business is being placed, which for prompt delivery readily brings \$1 to \$2 a ton premium over official prices. For forward delivery we quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Cotton Ties.—Contracts for upward of 900,000 bundles for this year's delivery have already been placed at the price agreed upon April 25, which was 95c. a bundle.

Tin Plate.—The American Sheet & Tin Plate Company has started up its Tin Plate mill at Gas City, Ind., and

will probably start its Moorewood plant, also in Indiana, as soon as a complement of men can be secured to operate it. This company is now operating 91 per cent. of its Tin Plate capacity and would be operating a larger percentage if Steel and a supply of men could be had. A good deal of tonnage in Tin Plate has been placed for third and fourth quarter deliveries. The market is very firm, but there are no intimations of an early advance in prices. We quote for third and fourth quarter delivery as follows: 3.90 for 100-lb. Cokes, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Bars.—Reports that the Carnegie Steel Company had taken orders for 28,000 tons of Steel Bars for shipment abroad are officially denied. The demand for Steel Bars continues unusually heavy from all kinds of consumers and is steadily in excess of shipments. Some few makers are in position to make reasonably prompt deliveries of Steel Bars, for which they are able to get from \$2 to \$4 a ton premium over regular prices. Larger makers, like the Carnegie, Republic and Jones & Laughlin companies, cannot take tonnage except for delivery for three or four months ahead. New demand for Iron Bars is fairly heavy, but is not as large as some time ago, some of the mills being in position to make reasonably prompt shipment. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery.

Spelter.—The market is dull and prices have shown a sharp decline. We quote prime grades of Western at 6.40c., St. Louis, or 6.52 1/2c., Pittsburgh, for prompt shipment.

Railroad Spikes.—There is a continued active demand for the smaller sizes, on which the mills are sold up for two or three months. For Standard sizes the new business offering is rather light, and prompt deliveries can be obtained. We quote Standard sizes at \$2.25 to \$2.30, and small sizes at \$2.45 to \$2.50 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—We note an active demand for Machinery and Tire Steels and also for special shapes. The mills are catching up on deliveries to some extent, but are still considerably behind. Prices are firm but unchanged as follows: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Merchant Pipe.—As yet no announcement has been made by the National Tube Company as to what action it will take in regard to prices on June 1. The demand for Pipe continues abnormally heavy, the leading mills being filled up from two to three months. The scarcity of labor and difficulty in getting prompt deliveries of Skelp are interfering with the output of Pipe to a considerable extent. The extreme discount on Merchant sizes of Iron Pipe is now about 67 per cent. on 3/4 to 6 in., on which a half point and sometimes a point is allowed to the large trade. The extreme discount on Merchant sizes of Steel Pipe, 3/4 to 6 in., is now about 73 per cent. to the large trade. Official discounts on Steel Pipe are as follows:

Merchant Pipe.	Jobbers, carloads. Steel.	
	Black.	Galv.
1/4 to 1/2 in.....	.64	.48
3/8 in.....	.66	.52
1/2 in.....	.68	.56
5/8 to 6 in.....	.72	.62
7 to 12 in.....	.67	.52
Extra strong, plain ends:		
1/4 to 3/8 in.....	.57	.45
1/2 to 4 in.....	.64	.52
4 1/2 to 8 in.....	.60	.48
Double extra strong, plain ends:		
1/2 to 8 in.....	.53	.42

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

<i>Standard Genuine Iron Pipe.</i>			
		Black.	Galv.
		%	%
3/4	to 6 in.	.67	.57
1 1/2	in.	.62	.50
3/8	in.	.60	.42
5/8	and 1 1/4 in.	.58	.42
7	to 12 in.	.62	.47
<i>Extra Heavy Iron Pipe, Plain Ends.</i>			
1 1/4, 1 1/2 and 1 3/4	in.	.62	.40
1 1/2	to 4 in.	.59	.47
4 1/2	to 8 in.	.55	.42

Boiler Tubes.—Merchant and Locomotive Tubes continue in active demand and mills that are in position to make reasonably prompt deliveries can get premiums of \$1 to \$2 a ton over regular discounts for forward delivery, which are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	41	47
1½ to 2¼ in.	42	59
2½ in.	47	61
2½ to 5 in.	52	65
6 to 13 in.	42	59

Coke.—Furnace Coke for spot shipment is still in abundant supply and prices are lower, strictly Connellsville Furnace Coke loaded on cars and which has to be moved having sold as low as \$2.25 a ton at oven. This, however, is an unusual condition and does not represent the market on Furnace Coke on contracts for last half of the year delivery, which may be quoted at \$2.65 to \$2.75 a ton at oven. Seventy-two hour Foundry Coke for prompt delivery is offered as low as \$3 a ton at oven. The output of Coke continues exceedingly heavy, the Upper and Lower Connellsville regions having made last week 416,583 tons.

Iron and Steel Scrap.—The Pennsylvania Lines, West, sold a large tonnage of Scrap on May 2 which brought very good prices. Old Car Wheels went at \$26; Iron Axles, \$31.75; Steel Axles, \$23; Forgings, \$15.60; Borings, \$13.50; Malleable Scrap, \$20; Steel Tires, \$20, and Heavy Steel Scrap of the best grades at \$18.50, all per gross ton, f.o.b., Pittsburgh. The tone of the market is firmer than two weeks ago, and there is more buying. Dealers quote as follows: Heavy Steel Scrap, \$18 to \$18.50, for Pittsburgh, Sharon and Steubenville delivery, prices depending on quality. No. 1 Wrought Scrap is \$19 to \$19.25; No. 2 Wrought Scrap, \$17.75 to \$18; Old Steel Rails, short pieces, \$18.25 to \$18.50; Old Steel Rails, rerollers, \$18.50 to \$18.75; Bundled Sheet Scrap, \$16.75 to \$17; Machine Shop Forgings, \$15.50 to \$15.75; Low Phosphorus Melting Stock, \$22 to \$22.25; Old Car Wheels, \$26 to \$26.50; Steel Axles, \$21 to \$21.50; Cast Iron Borings, \$13.50 to \$13.75; Grate Bars, \$16.25 to \$16.50; Stove Plate, \$16 to \$16.25; No. 1 Cast Scrap, \$22. All above prices are per gross ton, f.o.b., Pittsburgh, unless otherwise specified.

Cincinnati.

FIFTH AND MAIN STS., May 8, 1907.—(By Telegraph.)

Pig Iron.—Southern furnaces are assuming a very independent attitude and do not seem to care whether they dispose of further tonnage for the latter part of the year or not. It is reasonably certain that there is yet considerable Iron to be sold for the last half, but the furnaces are unwilling to come forward to any great extent, as everything points to a continuance of present market conditions, with a probability of, perhaps, higher prices in the near future. Inquiries, which are of a general nature, and which as a rule are not promulgated in the usual manner, appear to be larger and embrace more tonnage than the furnaces care to consider, and the consequence is that selling agencies are unable to close contracts as rapidly as desired for want of co-operation on the part of the furnaces. This practically gives the market a strong position and has resulted in a slight advance by a number of Southern producers, for third and fourth quarter delivery. As a general proposition, however, it is a difficult matter to assert to a certainty just what the ruling quotations are, each furnace apparently establishing a price to suit its own views. Iron for delivery during the remainder of the second quarter is less active, and prices range from \$21 to \$21.50, Birmingham. Last half delivery is quotable from \$19 to \$20, with the general tendency gradually toward the maximum figure. Southern Ohio Irons are all strong, with sales of Malleable at \$22. Bessemer is reported very scarce and exceedingly difficult to obtain, with quotations uncertain. There is an inquiry from one of the large melters for 2000 tons of Malleable for last quarter delivery, 1500 tons of Foundry grades for third quarter, 1000 tons for last half, besides numerous 300 to 500 ton lots, all of which are practically for delivery during third and fourth quarter. Two or three local foundries have contracted for the balance of the year's requirements, the tonnage, however, being small. Freight rates from Hanging Rock District to Cincinnati are \$1.15, and from Birmingham, \$3.25. We quote for second quarter delivery, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.	\$24.75 to \$25.25
Southern Coke, No. 2.	24.25 to 24.75
Southern Coke, No. 3.	23.75 to 24.25
Southern Coke, No. 4.	22.75 to 23.25
Southern Coke, No. 1 Soft.	24.75 to 25.25
Southern Coke, No. 2 Soft.	24.25 to 24.75
Southern Coke, Gray Forge.	21.75 to 22.25
Southern Coke, Mottled.	20.75 to 21.25
Ohio Silvery, 8 per cent. Silicon.	30.65 to 31.15
Lake Superior Coke, No. 1.	24.65 to 25.15
Lake Superior Coke, No. 2.	24.15 to 24.65
Lake Superior Coke, No. 3.	23.65 to 24.15

Car Wheel Irons.

Standard Southern Car Wheel.	\$29.00 to \$29.50
Lake Superior Car Wheel.	27.50 to 28.00

Coke.—The market is easy, the demand being light and supply abundant. This state of affairs will perhaps continue until some time next month, when last half contracts will perhaps give a better tone to the situation. We quote the

best brands of Connellsville and Virginia Foundry from \$3.25 to \$3.50, f.o.b. ovens.

Finished Iron and Steel.—Deliveries of Structural Shapes and Plates remain unchanged, with mills rapidly filling up on contracts for the latter half of the year. The mills are generally quoting 60 to 90 days on Universal Plates, while exceptionally good orders can be gotten out in three to four weeks. The large manufacturers of agricultural implements are beginning to place contracts for their specialties covering the coming season's requirements at considerable advances over the prices of last year. The Rivet market remains firm, while deliveries are being made in about 30 days. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.93c., with half extras; smaller lots from store, 2c., with full extras. Steel Bars, carload lots, 1.73c., half extras, smaller lots from store, 1.95c., with full extras. Base Angles, carload lots, 1.83c. Beams and Channels, carload lots, 1.83c., base. Plates, ¼-in. and heavier, carload lots, 1.83c., base, and smaller lots from store, 2.25c. Sheets, No. 16, carload lots, 2.05c., and smaller lots from store, 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from stock, 2.50c. Steel Tire, 1 x ¼ in. or heavier, 1.93c. in carload lots.

Old Material.—While there is something doing, the market is quieter. Receipts are light. We quote dealers' prices, f.o.b. Cincinnati, about as follows:

No. 1 R. R. Wrought, net ton.	\$16.50 to \$17.00
Cast Borings, net ton.	9.00 to 9.50
Steel Turnings, net ton.	12.00 to 12.50
No. 1 Cast Scrap, net ton.	17.50 to 18.00
Old Iron Axles, net ton.	25.50 to 26.00
Old Iron Rails, gross ton.	24.00 to 25.00
Old Steel Rails, long, gross ton.	17.50 to 18.00
Relaying Rails, 56 lb. and up, gross ton.	28.25 to 29.25
Old Car Wheels, gross ton.	24.00 to 24.50
Low Phosphorus Scrap, gross ton.	19.50 to 20.00

Cleveland.

CLEVELAND, OHIO, May 7, 1907.

Iron Ore.—Ore is moving more freely than a week ago, but there is still some delay on account of the cold weather. There are several cargoes on the way down the lakes now, and it is expected that a heavy movement will set in by the end of this week or the first of next. Most of the Ore that is coming in is going forward directly to the furnaces, although delay is caused some days by a car shortage, due to the large number of cars tied up in the coal trade. Ore shipments during April were 630,975 tons, which is a decrease of 816,411 tons compared with the same month last year, due to the late opening of navigation. Shipments this month will have to be very heavy to bring the movement to June 1 up to that of last year. The market is strong, and there have been heavy inquiries the past few days for Foundry and Basic Ores. Both low grade and high grade Ores that have not been already contracted for, however, are rather scarce. During the past 10 days leading Ore shippers have chartered vessel capacity to run through the season to carry about 1,000,000 tons of Ore. The shippers are in good shape, as the bulk of the Ore has been covered by season's contracts, but as a result of the late opening of navigation some of the shippers will have to depend more on wild tonnage than they expected. Ore prices are as follows at Lake Erie docks per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range Non-Bessemer, \$4.25; Mesaba Non-Bessemer, \$4; Siliceous Bessemer, \$2 to \$2.75; Siliceous Non-Bessemer, \$2.50.

Pig Iron.—The entire market is strong. The heavy buying movement of Northern Foundry Iron for the second half delivery which began two weeks ago continues, and, as a result, prices are a little stiffer. There is but little Iron of any kind left for sale for last half delivery in this district, and furnaces that have not disposed of their entire output are inclined to hold the remainder with the expectation of selling it as spot Iron at higher prices. Furnacemen are all predicting a shortage of Pig Iron during the latter part of the year. The sales of Foundry and Malleable Bessemer Iron in this market during the week, according to careful estimates, aggregate fully 20,000 tons, and there have been inquiries for about 10,000 tons more. The sales were made at \$22.50 to \$23, at furnace, the greater part of the Iron bringing the latter price. The minimum quotation now for No. 2 Foundry Iron is \$22.50 for the last quarter and \$23 for the third quarter. One furnace is holding for \$25 for the third quarter, and some are asking as high as \$24 for the fourth quarter. A few sales of No. 2 Foundry for the first quarter of 1908 are reported at \$22, Valley furnace, and sales of Malleable for the same delivery were made at about the same price. Sales of No. 2 Foundry Iron for spot delivery are reported at \$27, Valley furnace, or \$27.60, Cleveland. Local dealers in Basic Iron are being flooded with inquiries. A sale of 2000 tons of spot Basic was made at \$24, Valley furnace, and some for the last quarter and for the first quarter next year was sold at \$23, Valley furnace. The local interests have no Basic left for sale for the third quarter, and very little for the last quarter. Bessemer Iron, of

which there is little left for sale, is strong at \$23, Valley furnace, for the last half, although that price might be shaded a little for a good sized order. Dealers are now asking \$26 for No. 3 Middlesbrough for prompt delivery, which a week ago they quoted at \$24.50, delivered. Southern Iron is also stronger and scarcer. Quotations for the last half of 1907, f.o.b. Cleveland, are as follows:

Bessemer	\$23.85
Northern Foundry, No. 1.....	\$23.00 to 23.50
Northern Foundry, No. 2.....	22.50 to 23.00
Northern Foundry, No. 3.....	22.00 to 22.50
Southern Foundry, No. 2.....	23.85 to 24.35
Gray Forge.....	21.50 to 22.00

Coke.—The market is a little more active, there being a good demand for Foundry Coke for the last half delivery. Prices are about the same as a week ago. Foundry Coke is quoted at \$3.40 to \$3.50 and Furnace Coke at \$2.60 to \$2.70, at oven.

Finished Iron and Steel.—New business has been considerably heavier, a good sized tonnage being contracted for for last half delivery. Specifications continue to come in heavily for all kinds of finished material. Deliveries show no improvement but some mills seem to be getting a little further behind. Steel Bars for quick delivery are as scarce as ever. One or two small mills that are able to make deliveries of Steel Bars in from two to three weeks are asking premiums of \$4 to \$5 a ton, but not a great deal of premium business is being done. Contracts for future deliveries are being made on the basis of 1.60c., Pittsburgh. Iron Bars are in fair demand and contracts for future deliveries are being made at 1.70c. to 1.75c., Pittsburgh. The implement makers are buying more freely, some contracts for Steel Bars for the next year having been closed during the week at the established price. A number of implement makers have made contracts for disks, harrow teeth and other Steel specialties, at prices ranging from 25c. to 50c. per 100 lb. higher than a year ago. There has been a heavy demand for Plates and considerable tonnage has been placed for last half delivery. While one mill reports that it can make a little better delivery on Plates they are very scarce for prompt shipment, and one mill reports a number of sales for quick delivery at a premium of \$4 a ton. Sheets continue in good demand and are strong, although not many sales are being made at premium prices. Some of the independent mills are getting further behind and are unable to make shipments of Sheets within three or four months. The Structural situation is stronger, the mills receiving a good amount of both specifications and new business, and deliveries are a little worse. A sale of 600 tons of Light Rails for a traction line is noted here during the week, the mill, because of delay in getting other specifications, being able to make delivery in May. Billets are in fair demand, sales of Open Hearth Forging Billets being noted at \$34, base, at mill. Warehouse business continues good in all lines and no changes are noted in stock prices. Steel Bars are selling at 1.95c. out of stock and Iron Bars at 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.15c. The stock price on Boiler Tubes, 2½ to 5 in., is 64 per cent. discount, and on Black Iron Merchant Pipe, base sizes, 67 per cent. discount.

Old Material.—Prices on the whole are no weaker, but the market shows no more activity. There are plenty of inquiries, but practically no sales are being made, dealers claiming that they cannot close deals and make a profit. A deadlock seems to exist between the dealers and consumers, the price offered by the buyers leaving no margin for the dealer. Railroad Malleable is scarcer and stronger. Sheet Scrap and Tin Scrap are weaker. The Pennsylvania Railroad has sold a heavy tonnage of Old Material. The railroad offerings this week are about 4500 tons by the Baltimore & Ohio and a small tonnage by the Erie. Dealers' prices to the trade per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails.....	\$16.75 to \$17.00
Old Iron Rails.....	24.00 to 25.00
Steel Car Axles.....	21.50 to 22.50
Old Car Wheels.....	23.00 to 23.50
Relaying Rails, 50 lb. and over.....	29.00 to 31.00
Relaying Rails, under 50 lb.....	31.00 to 32.50
Heavy Melting Steel.....	16.50 to 17.00
Railroad Malleable.....	19.50 to 20.00
Agricultural Malleable.....	15.50
Light Bundled Sheet Scrap.....	15.50 to 16.50
Bundled Tin Scrap.....	15.00 to 17.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$26.00 to \$27.00
Cast Borings.....	10.00 to 10.50
Iron and Steel Turnings and Drillings.....	12.50 to 13.00
No. 1 Busheling.....	14.50 to 15.00
No. 1 Railroad Wrought.....	17.00 to 17.50
No. 1 Cast.....	18.00 to 19.00
Store Plate.....	14.50 to 15.00

The Superior Court has directed that the plant of the National Wire Corporation, New Haven, Conn., be sold to the highest bidder, the bids to be opened on May 30.

New York.

NEW YORK, May 8, 1907.

Pig Iron.—Some of the larger inquiries which have been in the market recently have not yet been closed. In the case of a leading electrical company the former inquiry for 6300 tons has been augmented by about 4500 tons for later delivery. Prices are firmer, and in the case of foreign Irons there has been a further advance. We quote spot Northern Iron \$25.50 to \$26 for No. 1 Foundry, and \$24.50 to \$24.75 for No. 2 Foundry. For the second quarter we quote \$24.75 to \$25 for No. 1 Foundry, \$23.50 to \$24.25 for No. 2 Foundry and \$22.75 to \$23 for No. 2 Plain. No. 2 Southern Foundry is nominally quoted \$26.25 to \$26.50 for spot, and \$23.25 to \$23.75 for the third quarter.

Steel Rails.—The railroads show little disposition to get on the books of the Rail mills for next year's requirements, though it is understood some space is being pre-empted in the Chicago District by Western roads which are accustomed to lead off in the buying in that section. The Harri-man lines have made inquiry in a tentative way for next year, announcing that only Open Hearth Rails will be considered. In the past week only scattering lots have been reported, these calling for 1907 delivery. The Alton, Jacksonville & Peoria bought 2000 tons, and miscellaneous lots amount to 6500 tons. A sale of 1400 tons was made for plantation track work in Cuba, and 600 tons was taken by the Cuba Railroad Company. South American and Mexican inquiries are still pending.

Structural Material.—So far as railroad buying goes the market is quiet, and the business ahead from this quarter is not large from present indications, though building projects in various parts of the country will make a good showing in a month or two if nothing untoward develops. The erecting companies find their calculations put out of joint by the unusual way in which material is coming forward from the mills. Riveted work in some cases is well ahead, while the deliveries on Beams are far behind. In the case of one New York building 1200 to 1500 tons of columns are on hand, while no Beams have been delivered. In another prominent instance large quantities of fabricated Steel have had to be put on storage ground waiting on the completion of foundations. The American Bridge Company turned out 51,000 tons of work from its shops in April, which was considered a fair record under prevailing conditions. The Structural mills are still seeing an improvement in the demand and anticipate greater activity in the early summer months. An inquiry of interest in New York City is for a floating dry dock at the yard of the Jno. N. Robins Company at Erie Basin. About 15,000 tons of Steel, chiefly Plates, will be required. On May 13 bids will be opened for the Manhattan approach to the Blackwell's Island Bridge, calling for 4500 to 5000 tons of Steel. The Pennsylvania Railroad is in the market for Steel for a number of elevated crossings, and the New Haven Road will place considerable bridge work in the near future. We quote for tidewater delivery, mill shipments: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock of material cut to length at 2¼c. to 2½c.

Bars.—The prices prevailing for the past fortnight have been well maintained on Bar Iron, which is quoted at 1.79½c. to 1.84½c., tidewater. The demand is somewhat better than it has been, and the position is undoubtedly strengthened by the inability of the Steel mills to make early delivery on Steel Bars. While the regular quotation on Steel Bars is 1.60c., Pittsburgh, or 1.74½c., tidewater, those who desire to secure delivery within five or six weeks are obliged to pay 1.84½c., or higher.

Plates.—Little business has been done the past week, but inquiries are somewhat better, calling in the aggregate for considerable tonnage. The Eastern mills are advising their agents to be cautious in taking contracts, in view of the strength of raw materials and the narrow margin of profit now obtained on the finished product. Quotations for tidewater delivery are as follows: Sheared Tank Plates, 1.84½c. to 1.94½c.; Flange Plates, 1.94½c. to 2.04½c.; Marine Plates, 2.24½c. to 2.34½c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The market has relapsed into dullness, which is due partly to the inclement weather and probably partly to the fact that foundries are so well sold up that buyers are unable to secure early delivery. Those who expect to place contracts are inclined to await developments a little later in the season. The limited business which has been transacted during the week has been placed at full prices—namely, on the basis of \$37 to \$38 per net ton, tidewater, for carload lots of 6-in.

Old Material.—Railroad lists this month are unusually heavy. One of the leading railroad companies has a list out which aggregates about 20,000 tons, included in which are 5000 tons of Old Car Wheels. While the supply of Scrap would, therefore, seem to be improving, the market maintains its full strength and prices show no recession. Heavy Mel-

ing Steel Scrap has been in particularly strong demand and some sales of good sized quantities have been made for delivery to mills in eastern Pennsylvania. It is understood that in some cases deliveries contracted for have run well into the autumn. Cast Scrap and Stove Plate are commanding full prices, with an active demand from foundries. Borings and Turnings are possibly a shade easier, but are not quotably lower. Wrought Scrap is still the least active commodity on the list, but even it is moving a little more freely, and the outlook for No. 1 Yard Wrought is considered more favorable, as a great deal of it has recently been shipped out to be sold as Heavy Melting Steel Scrap. It is expected that by June 1 the local yards will be quite bare of this class of material. Rolling mills are freely buying Busheling Scrap. A greatly improved demand has recently sprung up for Old Steel Rails of long lengths for re-rolling, and dealers now look for prices to improve. Relaying Rails are in fair demand. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for Melting	\$16.00 to \$16.50
Heavy Melting Steel Scrap	16.00 to 16.50
Old Steel Rails, rerolling lengths	18.00 to 19.00
Relaying Rails	27.00 to 28.00
Old Iron Rails	24.00 to 24.50
Standard Hammered Iron Car Axles	29.00 to 29.50
Old Steel Car Axles	20.50 to 21.00
No. 1 Railroad Wrought	18.50 to 19.00
Iron Track Scrap	17.50 to 18.00
No. 1 Yard Wrought, long	17.50 to 18.00
No. 1 Yard Wrought, short	17.00 to 17.50
Wrought Pipe	14.50 to 15.00
Light Iron	11.00 to 11.50
Cast Borings	12.50 to 13.00
Wrought Turnings	14.50 to 15.00
Old Car Wheels	23.00 to 23.50
No. 1 Heavy Cast, broken up	19.00 to 20.00
Stove Plate	16.00 to 16.50
Grate Bars	14.00 to 14.50
Malleable Cast	20.00 to 20.50

Metal Market.

NEW YORK, May 8, 1907.

Pig Tin.—The strike of the longshoremen on the steamship docks in this city may prove to be quite a disturbing factor in the Pig Tin situation should the market develop any animation. As it is, practically all the unsold Tin in this country, which is probably not over 250 tons at the outside, is in the hands of two dealers, and as but 275 tons have arrived so far this month, of which 225 tons is on the Minneapolis, which, although at her dock, is not being unloaded, it will be seen that the situation could easily become strained. There are afloat for American ports 2150 tons, of which about 1700 tons are scheduled to arrive this month. Business in New York has been dull, and although some sales were made on Tuesday at 42.10c., other holders held out for 42.25c. To-day the London market advanced slightly, but closed easy, at £192 5s. for spot and £188 for futures. Tin in New York is held to-day at 42.25c. The failure of the London market to respond to the statistics issued the first of the month was commented on quite generally, and it is stated that some of the prominent London operators do not look for much higher prices there.

Copper.—The European demand, which looked promising when prices were advancing last week, was suddenly nipped by a large interest offering a considerable tonnage at concessions from its former figures. This put an effectual damper on the offerings pending from European consumers, and although 24.50c. and 24.62½c. were actually bid for Electrolytic, and in some cases these prices were refused, the same interests which were unwilling to accept it a week ago are desirous of obtaining even 24.50c. now. What little demand there was from American consumers was likewise sharply curtailed, and the market is now exceedingly dull. The situation in Lake Copper is quite complicated, and although there have been no actual transactions from first hands, we revise prices to 24.87½c. to 25.50c. One of the reasons why sales at 26c. and 25.50c. are so persistently reported is that some of the producers of Lake Copper make monthly contracts and guarantee the price against any decline. Sufficient to say, the difference between the price of Lake and Electrolytic is unwarranted. In the absence of business prices are largely nominal, at 24.25c. to 24.50c. for Electrolytic and 23c. to 23.50c. for Casting grades. The continued canvass for orders in finished lines, such as Sheet Brass, Tubes and Wire, shows plainly that the Brass mills are not as congested as they were. In fact, it is becoming more and more difficult to sell Copper products of any description, this applying as well to Scrap Copper as to finished forms. The London market is dull, but the difference in the quotations between Standard Warrants and Best Selected is an enigma, and it would seem that, unless the price of Best Selected declines, Standard Warrants must advance. The closing London price to-day is £102 15s. for spot and £101 15s. for future, while Best Selected is held at £114 10s., although the discount of 2½ per cent. would bring this down to £111. The export situation is unfavorable, as during the first seven days of the month but 1299 tons were exported, which is about 500 tons less than the estimated imports.

Waterbury Average for Copper.—The Waterbury average for the month of April was 26c.

Lead.—There have been numerous offers of Lead below market quotations, but on investigation the Lead offered was found to be remelted and not up to standard. Soft Lead, however, is dull, at 6c. to 6.7½c. for large cars, and small cars at 6.7½c. to 6.15c. In St. Louis the price is unchanged, at 5.92½c.

Spelter.—The Spelter market is weak, caused undoubtedly by heavier supplies of Ore and a consequent excess in the supply of metal. Then, too, the buying demand has not been as heavy as a few weeks ago. Shipments of prime Western Spelter can be had in New York at 6.55c., New York, and 6.40c., St. Louis.

Antimony.—The auction sale of a 10-ton lot last week went at higher figures than was generally anticipated, being equivalent to slightly under 18c., duty paid. Business is dull and prices continue more or less nominal, although lower, at 22.50c. to 23.50c. for Cookson's, 20.50c. to 21.50c. for Hallett's, and 19c. to 19.50c. for outside brands.

Ferroalloys.—There is a better supply of Ferrosilicon, due to more favorable weather for the operation of the water power plants in Europe. Then, too, a new electrical works has recently been completed in Norway, which will furnish an additional supply. The demand, however, is unusually heavy, and spot stocks command \$110, while second half shipments are unchanged, at \$104 for 50 per cent. The combination price of \$150 for 75 per cent. continues. Ferromanganese is not at all active, and prices are unchanged, at \$68 to \$70 for prompt shipment and \$65 to \$67 for second half deliveries.

Nickel.—The price continues unchanged at 45c. for large and 55c. to 65c. for smaller quantities.

Quicksilver.—Business is dull, but the demand continues to be supplied at \$42 per flask for jobbing lots. Rothschild's price is unchanged in London at £7.

Tin Plate.—Business is largely confined to Bright Plates, which are in good demand. Prices are unchanged at \$3.90, f.o.b. Pittsburgh, and \$4.09, f.o.b. New York for 100 lb. IC Coke Plates. Foreign Plates are again 1¼d. higher in Swansea at 15s.

Old Metals.—The market is dull, and the supply seems to be greater than the demand. The following dealers' selling prices are slightly lower than those of a week ago, but continue largely nominal:

	Cents.
Copper, Heavy and Crucible	22.25 to 22.50
Copper, Heavy and Wire	22.00 to 22.25
Copper, Light and Bottoms	20.00 to 20.50
Brass, Heavy	15.50 to 16.00
Heavy Machine Composition	19.50 to 20.00
Clean Brass Turnings	14.00 to 14.25
Composition Turnings	17.00 to 17.25
Lead, Heavy	5.50 to 5.75
Lead, Tea	5.25 to 5.45
Zinc, Scrap	5.25

Iron and Industrial Stocks.

NEW YORK, May 8, 1907.

The market for the greater part of the week has been quiet but firm. Within the past few days, however, the rather unfavorable crop news has had its effect on prices of stocks, and values have receded to some extent, lower prices having been made on Tuesday than at any time during the period covered since last week's report. The range of prices has been narrow, as shown by the following highest and lowest prices from Thursday of last week to Tuesday of this week: United States Steel 37 to 38½, preferred 101¼ to 102¾; Car & Foundry common 37 to 38¾, preferred 99 to 99¾; Locomotive common 63 to 64½, preferred 109 to 110; Steel Foundries preferred 39 to 40; Cambria Steel 38½ to 39¾; Colorado Fuel 35¼ to 37; Pressed Steel common 35¼ to 37¾, preferred 92½ to 93¾; Railway Spring common 44 to 45, preferred 94½; Republic common 27¼ to 29, preferred 84¾ to 86; Sloss-Sheffield common 55¼ to 56½; Tennessee Coal 147¼ to 147½; Cast Iron Pipe common 37 to 37½; Can preferred 55 to 55½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 37¼, preferred 100½, ex-dividend; Car & Foundry common 37, preferred 99½; Locomotive common 63, preferred 109; Steel Foundries common 7¾, preferred 39; Colorado Fuel 35½; Pressed Steel common 35½, preferred 92; Railway Spring common 44; Republic common 26½, preferred 84¾; Sloss-Sheffield common 56¼; Tennessee Coal 147½; Cast Iron Pipe common 37¾, preferred 83; Can common 5¾, preferred 55.

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

The Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

The Shelby Iron Company has declared the regular annual dividend of 5 per cent., payable May 20.

The American Shipbuilding Company has declared the

regular quarterly dividend of 1 per cent. on the common stock, payable June 1.

The American Radiator Company has declared the regular quarterly dividend of 1 3/4 per cent. on the preferred stock, payable May 15, and 1 per cent. on the common stock, payable June 29.

The Machinery and Supply Convention.

CINCINNATI, OHIO, May 8, 1907.—During the last two days manufacturers and merchants in the machinery and supply trades have been gathering at the Hotel Sinton from all parts of the country. There are now upward of 500 men interested in these trades on hand to open the concurrent meetings of the three associations, which heretofore have labored to raise the standards in their respective spheres of these trades, and now for the first time meet simultaneously to work in unison for the betterment of the whole trade. The wisdom of effecting this joint convention has already been made manifest for the enthusiasm and evidence of *esprit de corps* shown by both manufacturer and dealer promise developments at this meeting which will place it in history as one of the greatest epochs in the supply trade.

The Executive Committees of the organizations of the American Supply and Machinery Manufacturers, the National Supply and Machinery Dealers, and the Southern Supply and Machinery Manufacturers met throughout the entire day on Tuesday, receiving reports and getting matters in shape so that the convention proper might proceed most expeditiously.

The opening session on Wednesday morning found the large convention hall filled, and the address of President Edgar E. Strong of the American Supply and Machinery Manufacturers' Association was received most enthusiastically. He opened with an able introduction defining the word association, and telling how combinations of commercial units might be employed for much good or the opposite. He said in part:

While general efficiency and wider acceptance of high standards are legitimate fruits of association and make association desirable, mere association does not assure these fruits. In order that the best results may be obtained it is necessary that the membership in general be honest and intelligent. I think no one will seriously question the assertion that it would be difficult, if not impossible, to handle to-day the railroad transportation of the country without the brotherhoods, not merely for lack of men of sufficient qualifications to do the work but for the need of the system. Having considered somewhat fully the conditions applying to associations in general, we may now inquire whether we, as dealers in machinery and supplies, have among us such qualifications as to warrant us in associating ourselves to secure the benefits that such an association promises. It would appear that there can be no class of men who are better prepared to avail themselves of all the conditions. In the first place, the men or concerns whose influence is predominant in our lines are comparatively few, resulting in less probability of difference of views and making it more feasible to get together than if a large number were to be made unanimous. Second, the men whose influence in a large measure outlines the policy of these concerns are broad-minded and intelligent and their experience has taught them, if nothing else has, that it is absolutely necessary to be honest, as much for the effect upon its members of an association which comprises those who dominate any particular line of business as for the effect of such an association on the public. In short, the public benefit is but little less than that to the association itself, if the association improves the morale and methods of any useful business. Perhaps, in fact, considering the comparatively few who compose the association, the advantage is on the side of the public. While friction occasionally comes to the surface, yet, aided by time and the good sense of the American people, this friction will work out a just relationship between trade associations and the law. This in my judgment does not mean that trade associations will be injured. If there is, as we believe, a positive good to the public from such associations, they will, on the contrary, increase and flourish. That there is such good is as certain as that ruinous competition and wasteful methods of distribution are an injury to the public.

No one of any pretensions to common sense will deny that business of a useful kind, reduced to or below the margin of existence, is a bad servant of the public. While existing conditions prevent any attempt to regulate prices, there are many other directions in which we may be active. Perhaps the most important of these is an effort to bring about a better understanding and closer relationship with the men whose produce we sell. Much has been done in this direction, as evidenced by the attendance here and the interest shown by so many of the members of the American Supply and Machinery Manufacturers' Association, whom we heartily and cordially welcome. Much more may be done by encouraging others to join that association and by showing in our purchases that we appreciate the position they have taken.

Just now, when there are two or more buyers looking for some man with something to sell, this may not be easy, but will this condition endure indefinitely? I hope so, but I am reminded of the anecdote of two gentlemen who were walking together in the rain. One of them, looking out at the clouds, thought he saw a small break and remarked to his companion, "I think it is going to stop raining, don't you?" To which the other replied, "I guess so; it always has." With an experience of over forty years, if I am asked if this prosperity is ever going to cease I can only answer, "I guess so; it always has." When that time comes, if it does come, we must not forget those who have shown themselves ready to consider us.

Among other items of interest to us all and which we think may properly be discussed is the question of cash discounts as between the supply and machinery dealers and the manufacturers whose goods they sell, also between the dealers and their own customers and the attitude of both dealers and manufacturers toward syndicate buyers or purchasing agencies and catalogue houses. Some of these questions will be ably treated by gentlemen who will address you, and we hope that all these questions will receive attention.

Owing to the absence through illness of E. J. Dempsey, Mayor of Cincinnati, the address of welcome was delivered by L. Pfaff, Vice-Mayor, whose felicitous remarks were acknowledged by President E. E. Strong. J. E. Riechman, president of the Southern Dealers' Association, then delivered an address, in which he referred to the interdependence of the dealer and manufacturer. Speaking of the resources of the South, he said: "It is a section of more than ordinary interest, not only on account of the importance of its agriculture, but also because of its growing industrial importance, its steady commercial expansion and its increasing financial independence. It was no less an authority than Andrew Carnegie who gave an estimate that the visible supply of iron ore in the United States would be exhausted in 35 years, but with the new discoveries made in the Birmingham District no one can pretend to put a limit on what it alone will produce, and a not overzealous partisan claims that when Pittsburgh shall have exhausted its available resources the Birmingham furnaces will still be found doing business." He referred to the textile and lumber interests, and concluded by saying: "We are not organized to combat the manufacturer, nor are the manufacturers organized to combat us. We are organized to try and assist one another."

Samuel L. Moyer, president of the American Machinery Manufacturers' Association, followed with an interesting talk in which he outlined the object of his association, saying that its members had put themselves on record as being desirous of so conducting their business as to give proper profits and protection to the dealer. He stated that his association now has 130 members, which is an increase of just 100 since the organization meeting held in Savannah two years ago. That the work of Mr. Moyer and his associates is appreciated was very evident by the prolonged applause accorded his remarks. Great enthusiasm was shown over the presentation of the address by T. James Fernley, secretary-treasurer of the National Hardware Association.

Pennsylvania Business Legislation.

HARRISBURG, PA., May 8, 1907.—The proposed law to establish the rights of workmen in damage suits, known as the Employers' Liability law, has held much of the interest in business legislation this week, and it is not improbable that the committee in charge will defer action on it owing to the illness of the chairman. Another hearing was given on it last evening, when representatives of the Mine Workers Union, various railroad and some trade organizations appeared in advocacy, but the committee postponed action. Objections were made to it by attorneys of numerous manufacturing, railroad and mining companies because of its far reaching effect. The bill virtually wipes out the principle of contributory negligence and makes liable for damages for injury or death the owners of plants who may be in no wise cognizant of the alleged defects and makes all officials vice-principals.

No action has yet been taken on the bills to increase the tax on stock and bonds of manufacturing companies and various other revenue raising bills, which were sent through the House without being given very careful consideration and are being studied by Senate committees.

The National Association of Manufacturers.

The National Association of Manufacturers will hold its twelfth annual convention on May 20, 21 and 22 at the Waldorf-Astoria Hotel, New York City. Parts of three days are to be devoted to the business sessions of the convention, during which addresses are to be made on some of the most important topics now before the business world by government officials, manufacturers and others prominently identified with these subjects. The annual banquet is to be held on the evening of May 22. Secretary Marshall Cushing states that it is already evident from the list of speakers obtained for the business sessions and for the banquet, and from the very large number of members who have signified their intention to be present at the convention, that it will be by far the most brilliant and important ever held by the association in its prosperous history. Among the speakers at the business sessions will be:

Hon. Charles A. Prouty of the Interstate Commerce Commission, who has promised an address on "Further Railroad Legislation;" Hon. Francis B. Loomis, formerly Assistant Secretary of State, on "Some Practical Results of the Convention Reform Agitation;" Charles M. Pepper, special agent of the Department of Commerce and Labor to investigate trade conditions in foreign countries, on "Foreign Trade: How to Get It and Keep It;" Dr. Charles P. Neill, Commissioner of Labor, Department of Commerce and Labor, on "Certain Aspects of the Child Labor Problem;" Arthur D. Dean on "Trade Schools: the Manufacturer's or the Pedagogue's Sort;" Captain Henry A. Castle, late auditor of the Treasury for the Post Office Department, on "Needed Postal Reform." No such programme of practical business talks on important present day problems has ever been scheduled for any former convention of the association.

Reports are to be read from the following committees: Bankruptcy, Child Labor, Consular Reform, Immigration, Industrial Education, Interstate Commerce, Merchant Marine, Patents and Patent Laws, Postal Affairs, Pure Food and Tariff and Reciprocity.

The chief speakers at the banquet will be Hon. Oscar S. Straus, Secretary of Commerce and Labor; Senator J. P. Dolliver of Iowa, who has promised that his address shall be on "The Revolt of the Unincorporated;" Rear-Admiral Charles D. Sigsbee, the hero of the Maine, for the Navy; Major-General J. Franklin Bell, chief of staff, for the Army, and Rev. Dr. Joseph Dunn Burrell, whose topic will be "The Era of Work."

Programme of the Mechanical Engineers' Meeting.

The spring meeting of the American Society of Mechanical Engineers will be held in Indianapolis, Ind., May 28 to 31. The headquarters will be in the Claypool Hotel, where the professional sessions will also be held. The following is the programme:

Tuesday evening, May 28, at 9 o'clock, in the auditorium of the Claypool Hotel. Address of welcome, with response by President Hutton, followed by an informal reception.

Wednesday morning, May 29, at 9.30 o'clock. Business session; reports of the tellers of election of members and vote on amendments, and reports of standing and special committees; new business can be presented at this time. "Report of the Committee on Standard Proportions for Machine Screws;" "Preliminary Report of the Committee on Refrigerating Machines;" "Collapsing Pressures of Lap Welded Steel Tubes," by Reid T. Stewart; "The Balancing of Pumping Engines," by A. F. Nagle; "A Comparison of Long and Short Rotary Kilns," by E. C. Soper.

Wednesday afternoon, May 29. Visits to various plants.

Wednesday evening, at 8.15 o'clock. Automobile symposium. "Bearings and Moving Mechanism," by Henry Hess; "Air Cooling of Automobile Engines," by John Wilkinson; "Materials for Automobiles," by Elwood Haynes; "Special Auto Steel," by T. J. Fay; "Railway Motor Car," by B. D. Gray.

Thursday morning, May 30, 9 o'clock. Superheated steam. "The Specific Heat of Superheated Steam," by A. R. Dodge; "Determination of Entropy Lines for Superheated Steam," by A. M. Greene; "The Flow of Superheated Steam in Pipes," by E. H. Foster; "Correlation of Furnace and Superheated Conditions," by R. P. Bolton; "The Heating of Store Houses," by H. O. Lacount.

Thursday afternoon, May 30. Excursion.

Thursday evening, May 30, 9 o'clock. Reception.

Friday morning and afternoon, May 31. Excursion to Purdue University, Lafayette, Ind. A professional session will be held at 10 a.m. in one of the university buildings. "Performance of Cole Superheaters," by W. F. M. Goss; "Experiences with Superheated Steam," by G. H. Barrus; "Use of Superheated Steam on Locomotives in America," by H. H. Vaughan; "Superheated Steam in an Injector," by S. L. Kneass; "A Hirm's Analysis of Locomotive Test," by S. A. Reeve.

Other papers are expected, but as they have not yet been received from the authors they are not listed in this programme.

The University of Illinois extends to the members of the society attending the convention in Indianapolis a cordial invitation to visit the university, where they will be received by Dr. L. P. Breckenridge, professor of mechanical engineering and director of the Government research station.

Garland Interests Consolidated.

The interests of the Safety Armorite Conduit Company, Garland Nut & Rivet Company, West Pittsburgh Realty Company and Woodhouse, Bopp & Co., all Pennsylvania corporations with offices in the Balley-Farrel Building, Pittsburgh, and plants at West Pittsburgh, have been consolidated under the title of the Garland Corporation, organized under the laws of New Jersey, with an authorized capital of \$3,000,000. Their total gross assets to January 1, 1907, are given as \$3,258,302.83, while current liabilities, not yet due, are given as \$153,684.63, leaving net assets of \$3,104,618.20.

The Garland Nut & Rivet Company was formerly located at Rankin Station, Pa., and manufactures rivets and chain, the plant having been removed to West Pittsburgh in 1902, after which new nut, bolt and wire drawing departments were added. Much of the machinery used was invented by the concern, being covered by patents, which results in reduction of costs in several lines of product. This plant covers three acres, and a large addition is now being built to take care of its steadily increasing business, which has more than trebled in the past three or four years. The Safety Armorite Conduit Company was originally formed in 1897, the plant being located at Rankin Station, Pa., until 1903, when it was removed to West Pittsburgh, enlarged and equipped with new machinery. The principal output consists of iron armorite conduits for interior construction, the product having been installed in many large buildings throughout the country, and a number of important contracts having been filled for the United States Government for use in battleships and Federal buildings. The plant of Woodhouse, Bopp & Co. is devoted to the manufacture of silk, and occupies a fireproof building at West Pittsburgh, 95 x 450 ft. The West Pittsburgh Realty Company owns over 500 acres at West Pittsburgh suitable for manufacturing purposes and for home sites, having direct connections with the Pittsburgh & Lake Erie and the Baltimore & Ohio Railroads. Several lines of street railroads are projected between New Castle and Beaver, one of which is expected will pass through West Pittsburgh.

The reasons for the consolidation of these interests into the Garland Corporation were that the plants can be operated with less expense, the output and sales can be largely increased and the business handled to better advantage under one management. John W. Garland is president; Henry L. Collins, vice-president; Robert Garland, treasurer; Charles A. Glaser, assistant treasurer; F. C. Hodgkinson, secretary; Charles Garland, assistant secretary; and the directors are the foregoing and John B. Jackson, F. H. Skelding, W. M. Hall, T. H. Bopp and Geo. H. B. Martin.

Former Premier Balfour of Great Britain, presiding over the Primrose League in London, May 3, came out squarely in favor of protection, under the name of preference.

Trade Publications.

Grinders and Polishing Machines.—Charles H. Besly & Co., 15-21 South Clinton street, Chicago. Catalogue. Size 9 x 5½ in.; pages 56. Describes a complete line of spiral disk grinders and polishing machines, the various types and sizes of which are illustrated. An additional line, including small tools, taps, reamers and dies, together with Helmet oil and oil cups, is also included.

Air Brakes.—Dukesmith Air Brake Company, Ferguson Block, Pittsburgh, Pa. Catalogue and bulletin. Describes and illustrates the Dukesmith air brake equipments, which include six devices—the straight air engine brake control valve; the combined release and retaining valve for locomotives; combined gauge and safety valve for locomotives; the engineer's automatic brake valve with straight air feature; the car control valve, and the automatic release signal. The descriptive matter pertains to their construction and design, methods of operating and piping, and to the company's air brake instruction car.

Power Hammer.—Charles Leonhardt, New Ulm, Minn. Special circular No. 12. Deals with Leonhardt's patent adjustable power hammer, which is claimed to be the only adjustable power hammer made, on which iron of any size up to 8 in. thick can be forged without changing the stroke.

Blacksmith Tools.—Buffalo Forge Company, Buffalo, N. Y. Pamphlet No. 77. Pertains to the company's regular line of blacksmith tools, including several entirely new machines and changes and improvements in the older designs. The subject matter covers geared hand blowers, electric blowers, portable forges, rivet forges, down draft forges, power forges and blowers, outdoor forges, stationary forges, heating forges, ball-bearing drills, armor plate punches, shears and cutters, tire upsetters and benders, disk wheels and ventilators, and Buffalo pumps, heaters and engines.

Valves.—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Circular. Pertains to valves for railroad water service, including the Anderson automatic and counter-balanced valve, which can be connected to any standpipe or direct to city mains; the Anderson patent float valve for controlling the water level in tanks or reservoirs, and the Anderson patent altitude valve for maintaining a uniform stage of water in supply tanks, &c.

Engines and Boilers.—Atlas Engine Works, Indianapolis, Ind. Bulletin No. 134. This is a general bulletin of illustrations and specifications of the entire Atlas line, consisting of single-valve throttling, and single-valve automatic self-contained engines; twin-coupled throttling, four-valve automatic self-contained, four-valve side crank splash oiling, and Corliss engines; horizontal tubular, high pressure tubular, 6-in. flue, internal fired, locomotive, vertical and water tube boilers, and the Atlas gasoline engine.

Valves.—Bridgman Brothers Company, 1426 Washington avenue, Philadelphia, Pa. Circular. Devoted to the Bridgman Improved quick-opening balanced regulating valve. Price-lists are given of brass valves with screwed and flanged ends, and iron body brass mounted valves.

Electrical Apparatus.—General Electric Company, Schenectady, N. Y. Bulletins. No. 4469, superseding No. 4378, deals with the types 0 and OS pocket instruments for direct and alternating current; No. 4472, superseding No. 4411, with mercury arc rectifier outfits for charging ignition batteries, and operating small motors, dental outfits, &c.; No. 4474, to the GE-76 railroad motor, giving views of the back, front and the parts of the motor; No. 4476, to the type PP dial controllers, designed to operate motors where the full reversing feature is not necessary; No. 4477, superseding No. 4326, to the type SD accessible manhole junction boxes. No. 4478 supersedes No. 7560 and lists the parts of the type K series parallel controllers. No. 4479 is descriptive of the Toledo & Chicago Interurban single-phase railroad, which is equipped throughout with General Electric apparatus. No. 4480 is devoted to pipe-thawing transformers, and No. 4483 to the type T automatic time switch for alternating and direct current circuits. Pages to replace Nos. 57, 58, 59 and 60 of the G. E. specialties catalogue are now being distributed.

Controllers.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. Bulletin No. 59, superseding page 59 of June, 1906, for insertion in loose leaf catalogue. Pertains to the C. & H. radial arm reversible controllers for cranes and hoists. These are made for 110, 220 and 500 volt circuits, and capacities from 1 to 100 hp.

Thermit.—Goldschmidt Thermit Company, 90 West street, New York City. Pamphlet. Deals with the Thermit welding process, which requires no permanent installation of any kind for supply of heat or power. Illustrations and descriptive matter pertain to some Thermit welding on steamships and its adaptability to railroad repainting. By this process there is no limit to the size of the casting that can be welded, and the weld not only joins but reinforces, by using a collar or ring of pure Thermit steel around the broken parts.

Crushers.—Sturtevant Mill Company, Boston, Mass. Pamphlet, series 98. Treats of the advantages of the unbreakable steel plate construction and cam and roll action embodied in the Sturtevant steel, rock and ore crushers.

Molding Machines.—E. H. Mumford Company, Seventeenth and Callowhill streets, Philadelphia, Pa. Loose leaf catalogue. Illustrates and describes a line of press-ramming, hand-ramming, jolt-ramming, rock-over, combined jolt and press ramming and multiple molding machines, also vibrators and sand mills. Some castings made on Mumford machines are shown.

Portable Electric Tools.—Fortuna Machine Company, 127 Duane street, New York. Catalogue. Contains descriptions and illustrations of electric drilling machines, with information regarding speed to be used for drilling through different materials, and illustrations showing machines in operation on various equipment. Also contains illustrations of electric grinding machines and slotting machines.

Package Conveyors.—The Robins Conveying Belt Company, 13 Park Row, New York. Leaflet. Describes a package conveyor system installed in the new store of B. Altman & Co., New York. Two illustrations show the general layout of the belt and the central discharging point where the packages are received prior to being placed in delivery wagons. There are three conveyors 30 in. wide and 71, 91, 191 ft. long, respectively, and one large flat belt 36 in. wide and 75 ft. long, for carrying unwrapped packages. The belts are driven by electric motors through worm gearing and are noiseless in their operation.

Car Headlinings.—The Indestructible Fibre Company, Wendell & MacDuffie, 26 Cortlandt street, New York, sole selling agents. Circular. Describes three materials for car headlinings and steamboat panels, these being various grades of fiber board sold under the trade names of Durite, Fibrite and Kantlite. The first is suitable for steam railroad and street railroad car headlinings; the second for the same and steamboat panels and partitions; the third is suitable for all the purposes mentioned, and being noncombustible is particularly recommended where fireproof qualities are required.

Reinforced Concrete Pipe.—Reinforced Concrete Pipe Company, Los Angeles, Cal. Pamphlet; 36 pages. Illustrates and describes a method of reinforcement by steel hoops with transverse steel strap bindings molded inside the walls of the pipe. The interlocking features of separate sections are shown. Interesting data relative to tests of crushing strains and internal pressure resistance are given. The application of this process to the manufacture of catch basins and manholes is also described.

Lathes.—Gisholt Machine Company, Madison, Wis. A supplementary catalogue pamphlet; gives special attention to Gisholt turret lathes (American type), illustrating their uses in the finishing of pulleys and operations in rough turning with gang cutters. A line of vertical boring mills is shown in which a 30-in. and 72-in. machine are illustrated.

Industrial Cars and Track.—Wonham-Magor Car Works, New York. 1907 catalogue. Size 6 x 9 in.; pages 160. Gives an illustrated description of the company's hopper cars, steel gondola cars and flat cars, various forms of dumping and mining cars, cars for billets, &c., cable railroad cars, mining buckets, charging wagons and cars, hand trucks, all forms of wooden gondola, flat box and hopper bottom cars, contractors' dump cars and tubs, coal tubs, skips, turntables, wheels and portable and permanent track, switches and crossings. Considerable information is given which is of use in the laying out of an industrial system, and dimensions, weights and capacities of the products listed are included.

Valves and Packing.—Jenkins Brothers, 71 John street, New York. 1907 catalogue and price-list. Size 6 x 9 in.; pages 128. Pertains to the Jenkins line of valves and packing, including various types and sizes of angle, check, gate, globe and radiator valves, and Jenkins rubber disks, '96 packing, '96 gaskets, gasket tubing, water cock washers, Fuller balls, union rings, gauge glass washers and stem packing. Price-lists of parts and dimensions of the valves are given in a tabular form. A telegraph code and a complete index are appended.

Electric Tools.—Chicago Pneumatic Tool Company, Chicago, Ill. Catalogue No. 21. Size 6 x 9 in.; pages 60. Deals with the Duntley air cooled electric tools, including one, two and three motor drills, portable grinders and blowers for direct and alternating current, magnetic old man for drilling, direct current portable hoists, drilling stand for the Duntley electric drill, and the Yale submarine electric lamp. Instructions on the care of electric drills and important points to observe in operating them are included.

Industrial Buildings.—D. C. Newman Collins, 29 Broadway, New York. Folder. Pertains to preliminary reports and layouts of industrial plants, and shows those submitted to the A. A. Griffing Iron Company, Jersey City, N. J.

Belt Conveyors.—Robins Conveying Belt Company, Park Row Building, New York City. Bulletin No. 16. Devoted to Robins conveying machinery as applied to ore handling. Illustrations and descriptions are given of apparatus installed at various mills, separating plants, mines, concentrator mills, &c.

Motor Applications.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Four pamphlets. These deal respectively with motors for driving coffee grinders, Champion blacksmith blowers, Blackeslee dish washers and sanitary air sweeping and scrubbing apparatus.

The Pennsylvania Steel Company's Annual Report.

The combined income account of the subsidiary companies of the Pennsylvania Steel Company of New Jersey for the year ending December 31 is as follows:

	1906.	1905.
Net earnings.....	\$5,462,983	\$4,986,248
Other income.....	505,468	277,717
Total income.....	\$5,968,451	\$5,263,965
Interest, &c.....	821,843	811,562
Balance.....	\$5,146,608	\$4,452,403
Depreciation.....	1,513,371	1,755,191
Surplus.....	\$3,633,237	\$2,697,212
Preferred dividend.....	1,653,000	1,164,000
Surplus.....	\$1,980,237	*\$1,533,212

* Entire surplus over preferred dividends was transferred to reserve for future plant improvements.

The general balance sheet of the Pennsylvania Steel Company of New Jersey as of May 1 compares as follows:

	Assets.	May 1, 1907.	May 1, 1906.
Cash		\$55,600	\$507,802
Loans		2,321,039	1,000,021
Stocks and bonds.....		25,377,147	26,129,690
Accrued interest.....		33,807	9,490
Totals.....		\$27,787,594	\$27,646,995
	Liabilities.		
Preferred stock.....		\$16,500,000	\$16,500,000
Common stock.....		10,750,000	10,750,000
P. and L. surplus.....		537,594	175,191
Loans from operating companies.....			221,800
Totals.....		\$27,787,594	\$27,646,995

The production of pig iron and steel ingots in each of the last five years has been as follows:

	Pig Iron.	Steel Ingots.
	Gross tons.	Gross tons.
1906.....	809,000	980,000
1905.....	748,000	847,000
1904.....	615,000	618,000
1903.....	665,000	837,000
1902.....	625,000	802,000

President E. C. Felton, for the Board of Directors, submits a statement from which the following extracts are taken:

Out of the balance of profits remaining, after deducting interest charges, charges to general and special depreciation and dividends paid, the subsidiary companies have transferred \$1,851,793.69 to their reserves for plant improvements. The subsidiary companies expended during 1906 \$2,328,590.94 for capital account.

In line with the policy of increasing ore reserves, the subsidiary company, the Pennsylvania Steel Company of Pennsylvania, purchased during 1906 six and one-quarter additional shares in the Cornwall Ore Banks and now owns a majority interest in that property. A notable addition to the supplies of iron ore has also been made by the subsidiary company, the Spanish-American Iron Company. During the last three years explorations have been carried on systematically by that company in various parts of the Island of Cuba, and these have resulted in the discovery of an extensive deposit of iron ore which has been acquired and which will be developed as fast as circumstances permit. The development will involve the building of a railroad, with the necessary ore docks, towns, shops and mining equipment, and if it is to be made rapidly and economically, will require to be financed independently of the current surplus earnings available for plant additions and improvements.

The producing mines of the Spanish-American Iron Company, near Santiago, in the Island of Cuba, made their maximum output in 1906. These mines are in excellent condition.

At the Steelton plant of the Pennsylvania Steel Company the 120 by-product coke ovens were completed with the year 1906, were started in January, 1907, and are now in full operation. The construction of a new open hearth plant, consisting of five 75-ton furnaces, was begun in June, 1906, and will be completed about the middle of the present year. Important additions were made during the year to billet mill and slabbing mill at Steelton and to

the ore and copper concentrating plants at Lebanon. The marine department of the Maryland Steel Company built 10 vessels during 1906, and also did an amount of repair work to ships about equal to previous years. The programme for the year 1907 comprises no important expenditure at the Steelton Works other than that involved in the completion of the new open hearth plant now under construction. At the Sparrow's Point plant improvements in the handling of raw materials for blast furnaces, from ships to the blast furnace plant, are contemplated.

The business outlook for the year 1907 is good. The amount of orders booked by subsidiary companies is in excess of any previous year. The increase in the cost of labor, supplies and raw materials will, however, considerably reduce their net profits.

The American Railway Association on Rails and Wheels.

The spring meeting of the American Railway Association, held at Chicago on April 24, discussed mainly car service, car efficiency, train rules, car diversion and other questions pertaining to freight movement. The association has a Committee on Standard Rail and Wheel Sections, which, while it has not taken any initiative in respect to specifications for rails and wheels, as have the Master Car Builders' Association on the latter and the American Railway Engineering and Maintenance of Way Association on the former, has co-operated with the committees of these associations. At the recent Chicago convention the following progress report was submitted by the above committee:

The representatives of the Master Car Builders' Association have reported that the standard wheel section, as adopted tentatively by the master car builders in convention last June, is proving satisfactory, and that they have no changes to suggest, unless such are made necessary by a consideration of the relation of the wheel to the rail. The investigation of this latter question thus far made would indicate that there is no necessity for a radical change in the American Society of Civil Engineers rail section, so far as its relation to the wheel as a bearing surface is concerned, but that most of the criticisms of the present section have had for their basis an effort to strengthen the rail by a better disposition of the material or an effort to so change the section as to obtain better results in manufacture.

The committee feels that some consideration should be given to the question of canting the rails, to conform to the coning of the tread, and experiments are now being conducted to determine the effect of this arrangement, especially in the feature of wear. The introduction of electric motors of low center of gravity, long, rigid wheel base and wheels of small diameter, will no doubt have an effect on rail wear in the future. The effect on the rails in the London tubes has already caused comment and has led to a suggestion for the appointment of a committee of the English engineers to investigate the subject.

The question of proper specifications for the manufacture of steel rails, which was referred to your committee at the October meeting, has been given careful consideration, and the committee has called to its assistance a number of expert chemists and metallurgists. A subcommittee has been appointed to prepare a draft of proposed specifications to form the basis of a discussion with the steel manufacturers, and when this draft is ready it is the purpose of your committee to take the matter up with all American rail makers in an effort to improve the quality of material in steel rails. It is thought that something substantial can be accomplished in this direction, if the unanimous approval of the members of the association can be had to the reasonable suggestions of the committee.

The Council of Ministers of the Russian Empire has decided to double track the Siberian Railroad. The section from Atchinsk to Irkutsk will be doubled this year.

The Machinery Trade.

NEW YORK, May 8, 1907.

The first week of the month has been productive of a good volume of business, there being no noticeable decrease in orders. Inquiries, however, were not quite as numerous, though several covering medium sized lots of tools were received, principally from industrial companies. The railroads appear to be withholding inquiries of any size and only making emergency purchases of a few tools. Within the past few days the Seaboard Air Line has sent out inquiries for some tools for its new Jacksonville shops, but only a few of the houses in this district have received the specifications. In this connection it is of interest to note that the New York, New Haven & Hartford Railroad has plans for new repair shops, to be erected at Hartford, Conn., the equipment for which is now being considered by the engineering department.

All being considered, April was a good month in the machinery trade. For one or two weeks business dropped off a little, but again took a turn upward, and the amount of business booked was very satisfactory. At one time there was some apprehension lest a downward course had started, but this was quickly dispelled by increased activity among buyers and a consequent increase in volume of business.

A prominent New York machinery man who returned recently from Europe declares that European manufacturers are crowded with work, and he gives it as his opinion that the reason for prosperity there is the fact that manufacturers in the United States have not been bothering a great deal of late about export trade, and, consequently, have left the competition largely between English and German manufacturers. One surprising feature of his observations in visiting German and English manufacturers was the fact that many of them are very busy with Russian business. Despite the fact that there has been a great deal of political turmoil in that country, he states the demand for machinery equipment for Russian enterprises is very large, and some German houses during the last few months have done the largest Russian business in their history. He was informed that the Russians appear to be going into the manufacture of hardware and the simpler forms of machinery to a large extent, and many of the demands for equipment come from comparatively new enterprises. The Russian Government has been placing large orders for machinery equipment for its arsenal work, and while German houses got most of the business, a considerable portion of it was placed with English houses.

On account of the large demand for mechanical equipment and the high cost of raw material and labor, manufacturers of certain classes of machinery are again considering an advance in price. Within a week or so a prominent manufacturer in this city expects to increase prices. The General Electric Company has made an advance of 5 per cent. in prices of electrical railroad apparatus, this being the second advance of like amount by this company since the first of the year.

Seaboard Air Line's Machinery Inquiries.

The Seaboard Air Line is asking for bids on equipment for its new Jacksonville shops, and a list now before the trade shows requirements for forging and blacksmithing equipment. These new shops will cover considerable ground, and as the machine and erecting shop will be quite large, the company will have to purchase a large amount of machine tool equipment. The machine and erecting shop will be 117 x 380 ft. There will also be a wheel, rod and tender shop, 66 x 260 ft., with an extension 60 x 66 ft.; tin and smith shop, 61 x 181 ft.; passenger car shop, 90 x 300 ft.; car wheel, axle and smith shop, 28 x 150 ft.; boiler and engine room, 63 x 122 ft.; planing mill, 50 x 176 ft. These are only the main buildings of the plant, the outlay including a number of small buildings, such as usually make up a complete plant.

It is understood that the recent buying of the Baltimore & Ohio Railroad was not against the big list which has been before the trade for several weeks past, but was to close out requirements for the company's Northwestern system, for which a small list was issued a short time ago.

The Tide Water Railroad, owned by the Virginia Railroad Company, Norfolk, Va., whose tracks will reach Victoria, Lunenburg County, Va., within the next 10 days, expects to construct the usual division facilities at that point. The company has not yet decided upon a location for its main shops.

The Coney Island & Brooklyn Railroad, Brooklyn, N. Y., which recently increased its capital stock for making improvements to its system, is understood to contemplate an extensive enlargement of its power house.

The Atha Tool Company, Chapel street, Newark, N. J., has purchased a good sized tract of land opposite its present

plant, on which some substantial additions will be made during the year, which will increase the company's output materially. The company has arranged to erect a two-story building of concrete construction, which will be 65 x 181 ft., and will cost about \$27,000. This structure will be used for adding to the company's general manufacturing facilities and for storage purposes, and it will be erected on the same side of the street as the company's present plant, abutting on the line of the Central Railroad. When this building is completed the company expects to begin the construction of another building of the same size on its property on the opposite side of the street, and when that is completed still another manufacturing building will be erected of similar dimensions. While complete plans have been made only for the first building, it is expected that within the next two years the entire improvements outlined will be completed. Arrangements are now being made for the machinery equipment for the first structure, and the company's present power facilities will take care of that building. The question of purchasing for the two subsequent buildings has not been gone into as yet. The Atha Tool Company's business has increased rapidly of late, and its present facilities are taxed to their utmost capacity in order to keep up with the demand, while in some lines the company has orders ahead for substantial quantities. The total cost of the additions to be made will, it is said, aggregate \$120,000.

A project that will call for considerable machinery in the New York market is that of the newly formed Sirocco Engineering Company, which has been organized to manufacture in this country centrifugal fans, blowers, pumps, elevators, conveyors and other equipment now made abroad by Davidson & Co., Limited, the proprietors of the Sirocco Engineering Works of Belfast, Ireland. The new company will take over the present business of Davidson & Co. in this country, and it has arranged to take temporary quarters in the Bush Terminal Building, Brooklyn, for a few months, until a large new plant can be built in this vicinity. William C. Redfield, a former Commissioner of Public Works in New York, who has had a long experience in manufacturing, will be president of the new company and will take active charge of its affairs. William S. Hulse will be vice-president, and Hugh T. Coulter, manager of the American branch for Davidson & Co., and Thomas Brown, who has also been connected with the New York office, will be associated with the new company. Davidson & Co. have been manufacturing its products in Great Britain since 1881 with good success, and the formation of the new company is largely due to the fact that the New York business has grown so rapidly of late as to make it necessary for the parent company to have some of its manufacturing done in this country.

Bids are being taken by the F. H. Ogden Company, 15 Clinton street, Newark, N. J., for equipment for the plant to be erected for the Universal Caster & Foundry Company at Newark. The inquiries include foundry and machine shop equipment and other machinery suitable for a plant for the manufacture of piano hardware, furniture casters, outlet boxes and a general line of small castings. A power plant consisting of 400 hp. of boilers, a 250-hp. engine and 125-kw. generator is to be installed, and electric motors ranging from 6 to 40 hp. for the operation of the shop equipment are to be put in. The requirements also include switchboard, heaters, separators, two air compressors, several air lifts, tumbling barrels, exhaust system, overhead trolleys, cupola, blowers, sand blast machinery, annealing and core ovens, an outfit for a japanning shop, plating equipment and a general line of machine tools.

Some purchasing has been done of late by the Dutchess Tool Company, manufacturer of bakers' machinery and ovens, Fishkill-on-Hudson, N. Y., whose plant is being considerably enlarged. The company is building a new foundry, 114 x 120 ft., and a two-story addition is being made to the machine shop, which will be 54 x 120 ft. Electric power for operating the machinery to be installed in the new building will be purchased from an adjacent light and power company. It is understood that the company is spending about \$54,000 on improvements, which will practically double the capacity of the plant. In addition to making a specialty of bakers' machinery and ovens, the company manufactures castings for the trade.

The demand for the Heisler locomotive has grown to such an extent that the Stearns Company, Erie, Pa., found it necessary to enlarge its facilities in order to continue the manufacture of sawmill machinery, which department was being crowded out by the locomotive department. The company has purchased the Ball Engine Works, which it will use exclusively for the manufacture of sawmill machinery, and it will be equipped with modern machine tools, the greater portion of which has been purchased.

The business of the William H. Hibbard Mfg. Company, 79-81 Washington street, Brooklyn, N. Y., has increased so rapidly that the sales thus far this year are much larger than for the same period of last year. The demand is so large that the company is shipping its machines as fast as they are completed, and has orders on its books at the present time from some of the largest manufacturers in the country

for its presses, riveting machines, buffing lathes, spinning lathes, &c. It is the intention to erect a new plant as soon as a suitable location can be secured, which will be equipped with the latest machinery. The company has recently appointed the Fairbanks Company, New Orleans, La., its Southern agents for the States of Texas, Louisiana, Mississippi and western Florida and southwestern Alabama.

Business Changes.

Alfred H. Schutte, New York, dealer in machinery and tools, has moved his office to 90 West street. Several of Mr. Schutte's branch houses abroad have moved into new quarters during the last few months, and their present addresses are as follows: Cologne, Germany, 18A-24 Neumarkt; Brussels, Belgium, 5 Vieux-marché aux grains; Liège, Belgium, 3 rue de la Cathédrale; Paris, France, 22-24 rue des petits-Hôtels; Milan, Italy, 22 Viale Venezia; Turin, Italy, 4 Via Alfieri; Genoa, Italy, 1 Piazza Pinelli; Barcelona, Spain, 18 Calle Lauria; Bilbao, Spain, 29 Gran Via.

The New York office of the B. F. Sturtevant Company has just been removed from 131 Liberty street to the Engineering Building, 114 Liberty street, where much better facilities will be provided for conducting the rapidly increasing business of this well-known company. The past year in particular has marked a rapid advance in the installation of Sturtevant generating sets in New York and vicinity, although a corresponding increase has occurred in the line of heating, ventilating, drying and mechanical draft apparatus, economizers and blowers.

W. L. Perkins, Jr., and H. M. Frecker have formed a partnership to sell machinery under the firm name of Perkins & Frecker, with offices at 136 Liberty street, New York. Mr. Perkins was for several years associated with the Saginaw, Mich., branch of Wickes Brothers, and Mr. Frecker has been for a long time with the Prentiss Tool & Supply Company.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 7, 1907.

No falling off is noted in the demand for machine tools. The month starts out with a good volume of orders and inquiries, and dealers report that their April sales were fully as large as they have been during any month for some time. Nearly all the orders placed have been, as they have for some time past, for one or two tools, for additional shop equipment. Most of the purchasers are anxious for early deliveries, although some users of machine tools, taking into consideration the poor deliveries on tools that are not kept in stock, are anticipating their requirements, and are placing orders for next year's deliveries. Local machinery manufacturers report business conditions very satisfactory, and nearly all of them have enough orders on hand to keep their shops busy for several months. Manufacturers are handicapped to some extent by delays in deliveries of iron and steel.

Although there are a number of inquiries in the market for a large quantity of machine tools for projected plants, the projects have not yet reached the point of closing for equipment.

The foundry situation is very satisfactory, the foundrymen as a rule having the full capacity of their plants covered for some time ahead, and some are compelled to turn away new business.

The general labor situation is very satisfactory, there being no trouble of any moment, aside from the strike now on at the plants of the American Ship Building Company, but which no longer appears to interfere very much with the work of that company.

The Superior Foundry Company has had plans prepared and will at once begin the erection of large additions to its foundry. A main building will be built, 176 x 190 ft.; pattern building, 25 x 50 ft.; finishing building, 55 x 288 ft.; chipping and cleaning building, 95 x 100 ft., and a carpenter and pattern shop, 48 x 64 ft. The buildings will be of steel and concrete. The company is now in the market for equipment for the additions. The new additions are required for casting piano plates and will increase the capacity of the departments from 255 to 550 per day. The company expects to have the additions completed by August 1.

The Ferry Cap & Set Screw Company, which is erecting a new plant on Scranton road, has its building, 40 x 150 ft., under roof, and expects to have the plant ready for operation about August 1. The company some time ago contracted for about \$30,000 worth of machine tool equipment, some of which is now ready for delivery. It will secure electric power from a commercial company, and will install at the start a 50-hp. motor. Additional motors may be purchased later.

The Mansfield, Ohio, Board of Trade has just completed arrangements to bring another industry to that city. A company will be formed to be known as the Mansfield Steel

Company, which will manufacture high-grade steel and other lines, which have not yet been announced. A site covering 2 acres has been selected, and it is expected that the erection of the plant will be started at once. The first investment in the plant will represent an expenditure of at least \$35,000 to \$40,000. The names of the promoters of the company, who are said to be prominent business men in other cities, have not yet been made public.

The Clauss Shear Company, Fremont, Ohio, has just acquired a building site adjoining its plant, and will at once begin the erection of two additions. Both buildings will be of brick, three stories high, 40 x 90 ft. One building will be used for the manufacture of safety razors. A number of other improvements are contemplated in the factory. The company now employs about 400 people and it is the intention to add about 100 more.

The Ohio Malleable Iron Company, Columbus, Ohio, which was recently acquired by the Jeffrey Mfg. Company, has let contracts for a new concrete and steel molding room, 75 x 250 ft. This addition will be complete in all details and be practically fireproof.

The new foundry plant of the Lattimer-Williams Company, Columbus, was placed in successful operation during the past week. A large amount of business has been booked, and the outlook for the entire year is exceedingly good.

The McClintic-Marshall Construction Company, Pittsburgh, Pa., has opened an office in Room 923, Columbus Savings and Trust Building, Columbus, Ohio, with F. C. Lewis in charge.

New England Machinery Market.

WORCESTER, MASS., May 7, 1907.

The week has been notable for a very unusual number of orders offered but not accepted because they carried with them deliveries which are simply out of the question. Every dealer in Boston complains that thousands of dollars' worth of business had to be turned down, because customers would not consent to dates of delivery far in the future. In many such cases customers have been putting off placing orders for months, hoping for a better condition for buying, and now they find that they cannot get what they want. Apparently there is a tendency to hesitate in preparing for machinery wants the last of the year and the first of 1908.

An element of no small importance is the experience which customers have had in getting tools on agreed dates. They complain that dates set for delivery were bad enough, but on top of the long agreed-upon wait weeks and sometimes months elapsed before the tools were actually on their floors ready for use. The result is that buyers do not take literally promises of shipments. The machine tool builders realize this. They regret that matters assumed the shape they did, for they would have liked to have lived up to promises made in all good faith. The fact is that business got away with them and they could not meet their contracts for shipment, no matter how hard they might try. The situation was out of hand for the time being. If customers decline to order unless they are certain of early shipments it may mean a chance to catch up on deliveries, and then the demand will continue on what the builders term a more healthful and generally satisfactory basis, with less protracted intervals between ordering and delivering. As it was, a goodly lot of orders was booked by the dealers during the past week. If they had been able to accept all business offered they would have had one of the record weeks of the last 12 months. The demand was mostly for small lots, and a good many single tools went on the books.

The Pratt & Whitney Company is credited with having received a very large order from the Winchester Repeating Arms Company, New Haven, comprising well upward of 200 machines, constituting one of the largest individual lots sold in New England of late months.

There is little change in the labor market. Men are apparently in as great demand as ever. The labor bureaus report rather a falling off in the number of applicants for places. An illustration of the rapid absorption of mechanics was afforded in the case of the employees of the Napier Motor Company of America, whose automobile works at Hyde Park were closed several weeks ago, throwing some 200 hands out of employment. Not one of these men has been registered at a labor bureau; their services were disposed of too quickly to make it necessary for them to seek assistance in getting work. Occasionally a manufacturer states that he has received an unusual number of applications for work, but these are rather exceptional cases. Workmen seem to be well satisfied with their present condition, with wages materially higher than they were a year ago and employment steady. Many men are earning extra wages working overtime at intervals, this having become a popular method of increasing production; in fact, the only method of keeping works running beyond the normal day, for it has been found practically impossible to get together two satisfactory shifts of men.

New England will send a large delegation to the spring

meeting of the National Machine Tool Builders' Association at Old Point Comfort next week, headed by President E. M. Woodward of Worcester. One large party will go by way of steamer from Boston, sailing Saturday, while others will go on by train, starting a little later. All will be on hand for the opening session, Tuesday morning, the 14th. Much interest is manifested in the reports of two committees—on apprenticeship and on cost system. The former, through its chairman, E. P. Bullard of the Bullard Machine Tool Company, Bridgeport, will complete its work. It is understood that the report will include a standard apprentice contract, framed with the idea of its adaptation to the needs of the various sections of the country. The committee on cost systems, consisting of Fred. A. Geier of the Cincinnati Milling Machine Company, Cincinnati; C. H. Alvord of the Hendey Machine Company, Torrington, Conn., and E. P. Bullard, will, it is said, submit some general form of cost system which may be adapted to the wants of those machine tool builders who have no adequate method of ascertaining exact costs of production.

The Boston & Albany Division of the New York Central Railroad has prepared what may be called tentative plans for large additions to the locomotive repair shops, Springfield, Mass., which have been alluded to in this column. Estimates of cost are being obtained from contractors, and until they are received no final decision will be reached. However, it is taken for granted that these shops or similar buildings will be erected this season, which means that a large amount of new equipment will have to be purchased. The present machine shop and blacksmith shop are parallel buildings, 480 ft. in length. The space between them will be utilized for the new shop, which will be 100 x 480 ft. This space will be divided into an erecting shop, 75 x 480 ft., and a machine shop, 25 x 480 ft. In addition, the plans, as prepared by the company's engineers, Boston, include a new tank shop, 80 x 200 ft., which will connect with the present blacksmith shop. Thus the new and the old buildings will form one great building unit. The company will be in the market for a large amount of new equipment, details of which are not decided. As usual purchases will be made by the New York Central at New York. Cranes will be included in the purchases, providing means of lifting locomotives as well as lighter work.

The New York, New Haven & Hartford Railroad is preparing plans for building new repair shops at Hartford, Conn. It is understood that there are to be a number of buildings erected, which together will form quite an extensive plant. The engineering department has under consideration the equipment for these shops.

The Sturtevant Mill Company, Dorchester, Mass., manufacturer of ore crushing machinery and other types of crushing apparatus, is to erect a new building, 40 x 85 ft. and one story, which will be devoted to offices. The space now occupied for this purpose will be converted into shop room, to increase manufacturing capacity. The company states that it has ordered the necessary new machinery.

The General Electric Company contemplates the erection of two new buildings this spring at Lynn, Mass., though no decision has been reached, something depending upon the results of estimates now being made of the cost of construction. The buildings will be three stories in height, one 400, the other 300 ft. long. One will be used to increase general manufacturing space, the other probably for carpenter and pattern shop. The machine tool dealers are already active in the contemplation of the placing of considerable orders for machinery, which will be required to equip the new buildings if they are erected. It is understood that the present volume of business, combined with crowded conditions, makes important some such provision for additional manufacturing space.

The Board of Trade, Haverhill, Mass., is contemplating the erection of an eight-story factory building, for rental to manufacturers.

The Jefferson Union Company, Lexington, Mass., manufacturer of the Jefferson union, has prepared plans which will permit of doubling the output of its works. The company will be in the market for several tapping machines only. The plant has already been increased of late, the result of improvements since a recent fire.

The Whitlock Printing Press Company, Derby, Conn., is to make an important addition to its machine shops by the erection of a four-story building, 50 x 80 ft. It will be used exclusively as a machine shop, as an addition to the company's press department.

The Tilton Optical Company, Tilton, N. H., manufacturer of optical goods, will double the size of its machine shop in order to provide for the manufacture of a large amount of new machinery, which will be installed in the company's works. An addition to the plant will be built immediately, to be 40 x 160 ft. and two stories. The company will also install new power equipment, including an engine of the Corliss type, of from 125 to 150 hp.

The Providence Gas Burner Company, Providence, R. I. is to largely increase its plant by the erection of a new building 60 x 60 ft., four stories and basement, and addition to an existing building 30 x 107 ft. and two stories and

basement. The company states that it has placed orders for the necessary new equipment.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 7, 1907.

The market appears to be on a more even basis, and both dealers and manufacturers of machine tools report fairly good sales. While orders for single tools have predominated, there have also been quite a number of contracts closed for small and medium sized lots. More activity has developed in buying on the part of the railroads, the bulk of the inquiry and business closed coming from Southern territory. Specifications from the Seaboard Air Line for its new Jacksonville shops, which were held up for some time, are now in the hands of the trade, while some business for the Fernandina, Fla., shops of the same company has recently been booked by one of the local dealers. The local railroads have made but few purchases, and those confined largely to single tools. Indications now point to the closing of orders for the tool equipment specified by the Standard Cast Iron Pipe & Foundry Company within the present week. The allotment of this business has been of considerable interest to the local trade, as most of the dealers have been bidding on the equipment. Some little falling off in inquiries has been noted by several concerns during the past few days, while on the other hand others report an increased number. From present indications, however, it looks as if there would be a fairly even demand without any of the rush features during the next month or two at least.

Manufacturers continue to operate plants at the full capacity. On some lines and sizes they have been able to offer somewhat better deliveries, while on others sufficient business has come in to preclude any chance of catching up closely for some months at least, particularly in the heavier tools. Practically all of the plants are booked well ahead, and deliveries of raw materials and supplies are hard to get promptly unless a premium is paid, and in some cases even that does not have the desired effect.

Foreign demand continues unchanged. But little business is being transacted in the regular lines of machine tools, although builders of special tools and machinery of various classes continue to book quite a fair volume of export business. Manufacturers building power transmission machinery and machine shop specialties continue to receive orders in good number, and several lines show quite a marked increase.

Business in second-hand machine tools continues good. In fact, dealers have been unable to supply the demand for some classes of tools, particularly those of the heavier types and of the larger sizes, of which there have been but few offerings. The smaller and lighter tools of the so-called standard types have also been selling quite satisfactorily, but the demand is not as large in proportion as that for the desirable sizes of the heavier tools.

There has been some improvement in inquiries for boilers and engines of the medium capacities, both new and second-hand, and some good business has been transacted by both manufacturers and dealers. Several propositions for large power equipment are under consideration. The demand for equipment of the smaller engines and boilers is somewhat quiet.

The foundry trades continue very active. While it is understood that better deliveries can be made in some lines, most of the foundries are well booked ahead, and it is difficult to get castings in any great quantity on much better delivery than has prevailed for some months back. Machinery castings particularly do not appear to be in any better supply, and tool builders are frequently held up on their deliveries owing to the inability to get prompt deliveries of certain kinds of castings.

A deal has been closed for the consolidation of the principal laundry machine manufacturers in the country, the American Laundry Machine Company, Chicago, Ill., absorbing the six leading manufacturers, which include, among others, the Barnes & Erb Company of this city and the Wilson Laundry Machinery Company, Columbia, Pa.

Considerable work in the way of extension by the various electric railroad systems in this territory is under consideration, mention of which has been made at various times in these columns. It is now understood that the contract for a branch extension of the Philadelphia & Garretttsford Street Railway, a subsidiary company of the Philadelphia & West Chester Traction Company, which will extend from Alden to Collingdale, has been let. The Rapid Transit Company of this city is also preparing to open an extension in the southwestern section of the city, to be used as a feeder to its new elevated and subway system in Market street. The work of building a new line from York to Hanover, Pa., for the

York Traction Company, will also be started in a few days. A large portion of this work is being done by Dodge & Day, engineers, of this city.

Dodge & Day, engineers, have recently been commissioned to develop and create a new plant for the B. L. M. Motor Car Company, to be located in Brooklyn, N. Y.; also to improve and make additions to the Madison, Wis., plant of the Gisholt Machine Company, and to make plans for extending the power plant of McKesson & Robbins, New York City. Considerable machinery equipment will be required for the plants of both the Gisholt Company and the Motor Car Company, but details are not yet available.

Sealed proposals will be received by the Supervising Architect, Treasury Department, Washington, D. C., until May 13, for a new high pressure steam boiler plant and accessories for the United States Court House and Post Office in Philadelphia. Plans and specifications may be had at the office of the custodian, or from the Supervising Architect as above stated.

J. E. & A. L. Pennock, engineers and contractors, have started work on the erection of a large factory building at Twelfth street and Washington avenue, being built for the Weightman estate. The building is to be 35 x 120 ft., five stories. It will be of reinforced concrete construction, and it is understood that on completion it will be occupied by the General Electric Company.

Chicago Machinery Market.

CHICAGO, ILL., May 7, 1907.

Although the demand for tools that can be promptly furnished is as great as it has been at any time for months past, it cannot be denied that both orders and inquiries for extended deliveries show some shrinkage. Manufacturers with shops full of work and with orders in hand that will tax their energies for months to come, are willing to buy all tools and machinery necessary to facilitate the completion of forward contracts as rapidly as possible; but there is at the present time little disposition to provide for a future demand of extraordinary proportions which at best must be of more or less doubtful realization. Aside from other contributing causes, the unprecedented flood of business that has poured in upon the market in almost unrestricted volume has, by the very congestion it created in productive sources, played an important part in checking the buying of equipment for future requirements. The abnormal market conditions growing out of this situation are of obvious disadvantage to users of machinery, and at the same time are not productive of unqualified benefit and profit to makers. While every one in the trade would doubtless welcome some moderation of the rapid pace at which things have been going, there is, nevertheless, apprehension lest reaction once begun may swing too far. There are, however, evidences of some conservatism in the present attitude of buyers, lending assurance to the hope that any reaction that may take place will be of a moderate and healthy character. Present demand is largely confined to orders for individual tools or limited assortments, indicating that the buying is for supplementary requirements rather than for large extensions or complete new equipment.

Reflecting the existent scarcity of ready tools, the demand for second-hand machinery is still strong. Serviceable lathes, planers, millers and, in fact, all kinds of machine tools, find ready sale at good prices. Second-hand engines that can be furnished ready for use at short notice, especially those of large horse power suitable for rolling mill service, are placed without difficulty. Indeed, dealers find more difficulty in securing than in selling such outfits. This demand is plainly of an emergency character, and is the result of overtaxed mill capacities that necessitate prompt increase of motive power.

The Coal & Iron Mfg. Company, with offices at 307 Fulton street, Peoria, Ill., has been incorporated with a capital stock of \$500,000, and will immediately begin work on a new plant for the manufacture of machinery and apparatus used in the equipment of garbage crematory plants. Eight or more buildings will be erected, ranging in size from 40 x 60 ft. to 100 x 150 ft., all of which will be furnished with the necessary tools and machinery for the equipment of boiler, blacksmith and machine shops and foundry. For the power plant there will be required one 150-hp. engine, four 60-hp. boilers, two condensers, three pumps and other auxiliary appliances. In addition to this oil and water tanks, gas holders, retorts, presses and mixers will be required for use in connection with the manufacture of machines for processing soft coal. It is estimated that the new plant with its equipment will involve an outlay of \$125,000. C. W. Smith is president; P. L. Kohl, secretary and treasurer; William M. Reid, vice-president and general manager.

The plant of Greenlee Bros. & Co., Rockford, Ill., makers

of woodworking machinery and tools, will be increased by the addition of a new foundry building, 70 x 200 ft., which will be used for heavy work. An addition to the hammer shop will also be erected. All buildings will be of steel construction. The company is now in the market for a part of the material needed, and will within a short time be ready to buy equipment for the foundry.

The Nicholson File Company, Providence, R. I., is investigating the adaptability of a gas producer system for the supply of its Anderson, Ind., plant, where natural gas is growing scarce. A producer, to meet the requirements of this plant, must furnish sufficient gas to run its various departments and to supply fuel for a line of small forges. Information relative to such an outfit will be of interest to the company.

The Hill-Standard Mfg. Company, Anderson, Ind., maker of children's vehicles, is also investigating the possible advantages of a gas producer plant. An engine for its factory and new power plant of some description will be needed in the near future, but no definite decision has been reached as to the form of power generators that will be selected.

The Wabash Gear Works, Terre Haute, Ind., recently incorporated with a capital stock of \$100,000, is equipping a plant with modern machinery for the manufacture of automobile transmission gears and parts. H. L. Warner is general manager.

The City Council of Fergus Falls, Minn., has adopted plans that embrace extensive improvements to the municipal electric lighting system and the addition of power service. It is proposed to raise the new concrete dam to a height of 29 ft., which will increase the effective head for generating power. Bids will be asked within a few days for the concrete dam construction, a new brick power house and a complete equipment of electric machinery. The estimated cost of improvements contemplated is about \$50,000.

Extensive plant improvements are planned by the Chattanooga Electric Company, Chattanooga, Tenn., which will involve a total outlay of about \$140,000. Included in these improvements, which when completed will increase the present power capacity about 2000 hp., will be a 1000-kw. steam generator, one 500-kw. generator, four 400-hp. unit water tube boilers. These installations, together with the necessary minor equipment and extensions, will bring the plant up to a modern standard of economy and efficiency.

Charles H. Glasser, formerly mechanical engineer of the Camel Company, Chicago, has accepted a position with the American Steam Gauge & Valve Mfg. Company, and will make his headquarters at the Chicago office. Mr. Glasser has had several years' experience in the mechanical field and has a very wide acquaintance.

The Canton Drop Forging & Mfg. Company, Canton, Ohio, has moved its Chicago office from 311 Monadnock Building to 1160 Old Colony Building.

The Chicago offices of the Browning Engineering Company have been removed from the Monadnock Building to Room 1506, Fisher Building, where the company has engaged a suite of rooms for its agency.

The Norton Company and the Norton Grinding Company, Worcester, Mass., have established independent sales offices and warerooms at 48 South Canal street, Chicago, Ill. The products of these companies have heretofore been handled in the Chicago District by the H. A. Stocker Machinery Company.

Government Purchases.

WASHINGTON, D. C., May 7, 1907.

The Isthmian Canal Commission will soon ask bids for a quantity of supplies, including two boiler feed pumps.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids on May 21, May 28 and June 11 for the following supplies for the various navy yards: Schedule 706, motors; schedule 711, hydraulic jacks; schedule 765, grinding machine, boring machine; schedule 766, radial drill, engine lathes, band sawing machine, wood boring machine, molding machine, riveters; schedule 767, pipe flanging machine, band sawing machine, water tube boilers; schedule 777, pneumatic pumps; schedule 800, alligator shear, steel casting plant, planer, boring and turning mill, tool grinding machine, pipe bending machine, milling machine and engine lathe.

Bids will be opened June 1 at the Bureau of Yards and Docks, Navy Department, Washington, for two motor generator sets for the New York Navy Yard, and economizers, fans, engines, &c., for the Portsmouth Navy Yard.

The Isthmian Canal Commission will receive bids until May 17, Circular No. 363, for pneumatic tools and hoists, jacks and other supplies.

Bids were opened April 27 by the chief signal officer of the army for one screw cutting engine lathe and accessories, as follows:

The Rudolph & West Company, Washington, \$228.93.

Montgomery & Co., New York, \$229.05.

The National Electrical Supply Company, Washington, \$338.88.

The F. W. St. John & Barnes Company, New York, \$223.70.

The General Electric Company, Schenectady, N. Y., has been awarded contract for the electrical machinery for the power plant for the Strawberry Valley irrigation project, Utah, at \$26,119.

Under opening of April 2, Circular No. 356, for supplies for the Isthmian Canal Commission, the following awards have been made:

The Chicago Pneumatic Tool Company, New York, class 1, item 1, air compressor, \$4087.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 1, item 2, generator and engine, \$3215; item 3, switchboard, \$220.

Under bids opened March 26, Circular No. 355, for supplies for the Isthmian Canal Commission, Manning, Maxwell & Moore, New York, have been awarded class 8, two screw cutting engine lathes, \$1307.56.

The following awards have been made for supplies for the navy yards, bids for which were opened April 23:

The P. H. & F. M. Roots Company, New York, class 13, one rotary blower, \$619.

The Brooklyn Forge & Supply Company, Brooklyn, N. Y., class 15, two hydraulic jacks, \$479.80.

The Hilles & Jones Company, Wilmington, Del., class 71, one combined punching and shearing machine, \$2445; class 72, one motor driven horizontal punching machine, \$1390.

Montgomery & Co., New York, class 73, one motor driven flue cleaning machine, \$535.

The C & C Electric Company, Philadelphia, Pa., class 121, one electric welding motor dynamo set, \$1700.

R. W. Geldart, New York, class 153, two portable electric radial drills, \$350.

The George F. Blake Mfg. Company, New York, class 158, two air and circulating pumps, \$756.

Catalogues Wanted.—Cole & Staiger, 32 Warren street, New York, desire catalogues of general machinery and engineers' supplies.

An Indiana Electric Railroad.

Indiana and Ohio have for some time been the fields for a network of interurban trolley systems of great extent. A new line in Indiana is that of the Indianapolis, New Castle & Toledo, which has a length of 140 miles. The main power station is near New Castle, and there are one portable and ten permanent substations, one of the latter being in the main generating station. The main power house has at present two turbo-generating units of 1000 kw. each, operating three-phase, at 2300 volts and 25 cycles. The three horizontal watertube boilers operate at 175 lb. and 50 degrees superheat. Each is rated at 400 hp., and is fitted with mechanical stokers. The feed water heater is capable of handling per hour 45,000 lb. of water. The condensing outfit has been designed for taking care of 40,000 lb. of exhaust per hour.

Each alternator is supplied with its own exciter. Six 350-kw. oil filled and water cooled step-up transformers are used to raise the voltage to 33,000. They are arranged in banks of three each, one bank for each generator. Three converter transformers of 150 kw. oil filled and water cooled reduce the pressure to 405 volts, at which it is fed to the rotary converter of 400 kw., to be transformed into direct current at 650 volts for the feeder line. Each of the substations is provided with a rotary converter and three transformers, similar to those in the main substation. All transmission, both feeder and high tension, is carried on pole lines, no third rails being used.

For high speed train operation 70-lb. T rails, heavily ballasted, are used. Each of the passenger cars is provided with four 75-hp. motors, giving 300 hp. per car, and controllers are installed of the series-parallel type. In addition, two 50-ton electric locomotives are used for freight haulage and switching purposes.

General Manager C. D. Kauffman of the Susquehanna Iron & Steel Company, Columbia, Pa., says the plants of that company, which will be sold May 31, will be sold as "going plants." Their operation will be continued immediately by the purchasers, with possibly the interruption of two or three days during the first week in June to allow an inventory of the stock to be taken. There is no possibility of the destruction or abandonment of the mills, the pipe mill particularly being of the most modern construction.

CONTENTS.

	PAGE.
Motor Drive for Lathes. Illustrated.....	1407
An Improved Rockford Shaper. Illustrated.....	1409
The German-American Tariff Convention.....	1410
The Strawberry Valley Tunnel Project.....	1413
The New Wickwire Furnace at Buffalo.....	1413
A Motor Driven Hooper Hack Saw. Illustrated.....	1413
The Centrifugal Dust Collector for Blast Furnaces. Illus.....	1414
The Pittsburgh Traffic Club.....	1415
Weldless Chain Manufacture. Illustrated.....	1416
The New Franklin Air Compressors. Illustrated.....	1418
A Large Warren Pump and Condenser. Illustrated.....	1420
Furnace E of the Bethlehem Steel Company.....	1420
The Fortuna Electric Breast Drill. Illustrated.....	1421
The C. I. F. Company.....	1421
Iron and Steel Bounties in Canada.....	1422
Business Opportunities.....	1422
The Monarch Gate Valve. Illustrated.....	1423
The Philadelphia Foundrymen's Association.....	1423
The Foundrymen's Convention at Philadelphia.....	1424
The Pittsburgh Foundrymen's Association.....	1424
Pneumatic vs. Electric Drills.....	1424
The Sheeler-Hemsher Improved Crucible Furnace.....	1425
New Ore Unloaders at Lake Erie Ports.....	1425
Editorial:	
A Quiet Labor Situation.....	1426
Ground Car Wheels and the Life of Rails.....	1426
A Kentucky View of the Railroad Question.....	1427
The Latest Fuel Saving Fallacy.....	1427
Correspondence.....	1428
Recent Customs Decisions.....	1429
Labor Conditions in San Francisco.....	1429
Labor Notes.....	1429
The General Fireproofing Company's Improvements.....	1429
Personal.....	1430
Obituary.....	1430
Mild Steel in Shipbuilding.....	1430
Record Rate of Pig Iron Production.....	1431
News of the Works:	
Iron and Steel.....	1432
General Machinery.....	1432
Power Plant Equipment.....	1432
Foundries.....	1433
Bridges and Buildings.....	1433
Motors and Small Engines.....	1433
Fires.....	1433
Hardware.....	1433
Miscellaneous.....	1434
The Browning Engineering Company.....	1434
Self-Registering Electric Targets.....	1434
The Iron and Metal Trades:	
A Comparison of Prices.....	1435
Chicago.....	1435
Birmingham.....	1437
Philadelphia.....	1437
Pittsburgh.....	1438
Cincinnati.....	1440
Cleveland.....	1440
New York.....	1441
Metal Market.....	1442
Iron and Industrial Stocks.....	1442
The Machinery and Supply Convention.....	1443
The Importance of Correctly Sized Gear Blanks.....	1444
Garland Interests Consolidated.....	1444
Trade Publications.....	1445
The Pennsylvania Steel Company's Annual Report.....	1446
The American Railway Association on Rails and Wheels.....	1446
The Machinery Trade:	
New York Machinery Market.....	1447
Cleveland Machinery Market.....	1448
New England Machinery Market.....	1448
Philadelphia Machinery Market.....	1449
Chicago Machinery Market.....	1450
Government Purchases.....	1450
An Indiana Electric Railroad.....	1451
Hardware:	
Condition of Trade.....	1452
Notes on Prices.....	1453
The Boston Convention.....	1454
Judicial Decision on "Unfair Competition." Illus.....	1455
Holley-Mason Hardware Company's New Building.....	1456
Export Trade Topics.....	1457
Pennsylvania Bill for Branding Paints, &c.....	1458
Price-Lists, Circulars, &c.....	1458
Trade Winning Methods. Illustrated.....	1459
Trade Items.....	1459
Hardware Window Display. Illustrated.....	1460
Trade in the Philippines, Cochín China and Federated Malay States. (Concluded.).....	1461
An Eastern Merchant's View of California.....	1462
Correspondence.....	1464
Russell & Erwin Mfg. Company's Price-List.....	1464
Requests for Catalogues, &c.....	1464
American Lighting System Generator and Tank. Illus.....	1464
Nicholson's E-Z Post Hole Digger. Illustrated.....	1465
Mortar Wheelbarrows. Illustrated.....	1465
Curve Cutting Snips. Illustrated.....	1466
The Square Deal Fence. Illustrated.....	1466
A New Railroad Track Jack No. 92. Illustrated.....	1467
The Bell Elastic Barb Wire. Illustrated.....	1467
Current Hardware Prices.....	1468

HARDWARE

THERE has been in Hardware, as in other branches of trade, a disposition on the part of manufacturers to imitate the products of other manufacturers, even when the goods in question were of novel design. In this way the endeavor was made to secure the advantages of what their competitors had done in originating and making popular certain styles and patterns. This imitation has in a great many cases been carried to such an extent as to mislead the public, who presumed that they were purchasing what may be termed the original article, when, in fact, they were really purchasing the product of another manufacturer, which was identical in its general appearance though different in the name of the maker, unobtrusively placed upon it, or in some slight details of finish or construction. Those who are familiar with the Hardware market will recall a multitude of articles which have thus come into being, the making of which comes under the technical term of unfair competition.

The definition of this term is one of the provinces of the courts, and it obviously calls for judicial care, notwithstanding the fact that the general principles involved in the question are well established. It is as a matter of trade ethics gratifying to be able to report that the courts are tending to define the law in regard to unfair competition in such a way as to discourage the imitation of goods in its reprehensible form, and to protect the manufacturer who by originality and enterprise succeeds in establishing a market for a new and attractive style of product. We have had occasion to refer heretofore to more than one case in which the courts have rendered decisions which throw the safeguards of the law around the making and sale of goods which have a distinct character and style, which, with the merit which they possess, commend them to the public. A recent decision on this interesting and important topic is referred to in another column.

The constant increase in the trade relations between Canada and the United States is notable, notwithstanding the influence of laws on both sides of the border tending in one way or another to discourage such transactions. The fact is especially significant in view of the policy adopted by the Dominion of favoring Great Britain under a preferential tariff. The course of trade and the growing volume of American goods exported from this country into Canada, notwithstanding the existence of a sentimental loyalty toward Great Britain and very wise and vigorous efforts to build up their own industries, indicate the fact that there are certain practical advantages possessed by American manufacturers and merchants which enable them to more than hold their own in the contest for the markets of the Dominion. While there will undoubtedly and very happily be a great increase in the manufacturing interests of that great and rapidly developing country, which is coming to a late but swift realization of its resources and the splendid possibilities which open before it, there is reason to anticipate that this country will continue to have an enlarging trade with it, whatever may be the course in its markets with the products of the mother country.

Condition of Trade.

The continued cold, unseasonable weather has apparently led to a slight falling off in the volume of business in some quarters of the Hardware market. There is also evidence that buyers of finished products are showing conservatism in placing orders, in spite of the fact that the raw material markets have again developed notable strength. Certainly there is an absence of purchases of a speculative character. At the same time stocks are being steadily reduced by continued demand from consumers, and the healthy flow of orders to supply immediate requirements has been so great that few manufacturers have made large strides in catching up with their deliveries. Some improvement in this direction, however, has undoubtedly been made. Far from complaining at the slackening pace, most manufacturers and their agents express decided satisfaction at experiencing some relief from the strain to which they have been subjected, welcoming the opportunity to clean up old contracts, turn out special orders, which have long been sidetracked, and devote much needed attention to their factory systems, cost sheets and working forces. Many manufacturers state that their operations during the past year or more have not yielded a profit commensurate with the volume of business transacted. They have been handicapped by the fact that their productive costs have increased more rapidly than could be reflected in the prices secured for their output, and, moreover, the strain and confusion of running so long to utmost capacity in the vain attempt to keep pace with orders have proved expensive and even demoralizing. As a result of the backward spring retail merchants in many sections have not been disposing of seasonable goods in the expected volume, a fact which has recently been felt by jobbers in lighter orders for these lines. Considerable is being heard of labor troubles, which in not a few localities have operated to check constructive operations, leading to reduced sales of some lines, especially Builders' Hardware. At present a wharfmen's strike is in progress which has seriously interrupted the transportation facilities of this city. It would seem that monetary conditions have not improved to the extent which might be imagined from reports in the daily papers, collections being only fair.

Chicago.

In face of conditions that might reasonably be expected to have an adverse effect on trade business in practically all Hardware lines continues to show a remarkable degree of strength and firmness. Blizzards in the Northwest and killing frosts extending as far South as Kansas and Missouri have been reported with frequency throughout the month of April. Drought and bugs have menaced the crops over considerable areas of important agricultural territory, and though reports are on the whole much exaggerated, the fact that notable damage has been done in various localities is generally recognized. Yet in view of these facts there has been but little, if any, shrinkage in the aggregate volume of business. Though the totals of April sales were somewhat short of the previous month they exceed those of the same month a year ago, and even a better showing would have been made but for the slow receipt of shipments, which prevented the full execution of a large number of orders received. There is very little tendency toward fluctuation of prices, and while the upward movement seems to have reached its limit, the present level of values is maintained with a good deal of firmness. The demand for Wire Nails and

Wire products is almost unprecedented, both as to volume and its prolonged continuance. Even requirements in Barb Wire, which are at this season of the year usually provided for, are still unsatisfied, and mills have not yet caught up on orders. Heavy Hardware jobbers report increasing activity in many lines and great difficulty in maintaining unbroken assortments in stock sizes of Plates, Sheets and Bars. Wood stock is in equally great demand and likewise scarce. It is evident that the present great momentum in trade movement will, under any conditions, prevent sudden reaction in market activities, but until the crop situation is better understood and the dangers threatening it have disappeared there will naturally be more or less conservatism displayed in the placing of orders for distant delivery.

NOTES ON PRICES.

Wire Nails.—Conditions which have ruled for some weeks are still prominent, these including shortage in the supply of Steel, scarcity of cars and the consequent delay in mill shipments. Mills are from one to three months behind deliveries, while stocks at mills and in jobbers' hands are light. It is understood that premiums are being paid for prompt shipments. Contractors who have work under way can better afford to pay 5 and 10 cents more a keg for Nails than to have workmen idle to whom they are paying wages. The market continues very firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

New York.—The local demand has shown some improvement, but not so with jobbers' stocks. It is difficult to supply the requirements of customers owing to delayed shipments from mill, and especially so on special Nails and various sizes. Assortments vary at different times according to Nails received by jobbers and to requirements of customers. New York quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots at store, \$2.30.

Chicago.—The monotony of reports that for succeeding weeks have recorded the piling up of orders has not yet been broken. The mills are, however, gaining ground in their effort to catch up, and less strenuous conditions are already in sight. While the general reports of crop damage in circulation are doubtless exaggerated, it is certain that extensive hurt has been done to growing crops by insects and killing frosts. Quotations are as follows: \$2.15 in car lots to jobbers and \$2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The supply of cars is reported to be slightly better, but this is offset by the increasing shortage in supply of Steel, so that the Wire Nail mills instead of catching up on deliveries seem to be getting further behind. All the mills are from one to three months behind in deliveries of Wire Nails, and stocks held by jobbers and mills are very light. Customers are becoming very impatient, and some have gone so far as to threaten legal proceedings unless their belated orders are filled. Prices are very firm and premiums of 5 to 10 cents a keg have been paid for prompt shipments. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

Cut Nails.—Some manufacturers have advanced their price on Nails 5 cents per keg, since the meeting of the Cut Nail Association, which was held on April 30. The difference in the price of steel and the selling price of Nails is so small that the regular quoted price leaves but a limited margin of profit to the Nail manufacturers who buy their raw material. This has led some manufacturers to use scrap and other material, producing a grade of Nails which would hardly be acceptable if there was not so much difficulty in obtaining them. Mills have

not yet caught up with their shipments. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of and including Buffalo and Pittsburgh, are held at 10 cents advance on Steel Cut Nails.

New York.—The demand is showing some increase, but jobbers' stocks are still more or less broken in assortment, owing to inability of mills to make prompt shipments. Jobbers' quotations are on the basis of \$2.30 for small lots at store.

Chicago.—Some improvement is reported in mill shipments, though car service is still the cause of more or less annoying delay. A little quieter demand is noticed, which is attributed, in part, to the recent stretch of unseasonable weather. Quotations are as follows: Iron Cut Nails, car lots, to jobbers, \$2.30; to retailers, \$2.35; Steel, to jobbers, in car lots, \$2.20; to retailers, \$2.25.

Pittsburgh.—The demand for Cut Nails has fallen off to some extent, but owing to the continued shortage in supply of cars and in steel the mills are still somewhat behind in shipments. Specifications against contracts are coming in very freely. Prices are unchanged, but firm. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west and including Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—The demand is falling off in a degree, new business being less in volume. The mills are still behind in making deliveries on contract orders, which are overdue. It is probable, however, that they will get back to normal conditions in the near future. The market is firm, and quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Chicago.—Though there are many consumers still anxiously awaiting belated orders, the rush of new business is a little less crowding than heretofore. It is thought that from now on the mills will make better progress in getting back to normal conditions. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.30; Galvanized, \$2.60; to retailers, car lots, Painted, \$2.35; Galvanized, \$2.65; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, Bright, in car lots, \$2.25; Galvanized, \$2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Owing to lateness of the season, new demand is falling off to some extent, but the mills are still behind in deliveries on contracts which should have been filled and shipped some time ago. The scarcity in Steel seems to be getting more acute, but the supply of cars is reported as improving. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Smooth Fence Wire.—Manufacturers are still pressing mills for shipments to get sufficient Wire to keep their factories going. Mills are still behind in shipments. The market is firm, and quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.85
Retailers, carloads.....	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago.—Wire using industries are pressing the mills for supplies to keep their factories going. The demand for all sizes of Smooth Wire is unabated and Fence makers are especially insistent for deliveries. Quotations

are as follows: In car lots, to jobbers, \$2, f.o.b. Chicago, and to retailers, \$2.05.

Pittsburgh.—We note a very active demand, requirements of Fence manufacturers having been much larger this year than usual, and this with the shortage in supply of Steel and cars has put the mills very much behind in deliveries, on which they are not catching up to any extent. Specifications against contracts are heavy and shipments by the mills are large. We quote f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9.

Binder Twine.—The condition of the market may be described as quiet and dull. A marked revival of buying will probably await more definite indications as to actual crop requirements. Regarding prices, reports indicate that some concerns are making no concessions to induce trade, while others are using the "plain tag" plan to further sales, and shaded prices are being met, in some cases, for either regular or plain tagged goods. The following quotations fairly represent the market:

	Per lb.
Sisal	9½ to 9¾
Standard	9½ to 9¾
Standard Manila	10¾
Manila (600 ft.)	12¼
Pure Manila	13¾ to 14

Carloads ¼ cent less; five ton lots ½ cent less, central delivery.

Roofing.—There is a continuation of the exceptional demand for Corrugated Roofing, both Painted and Galvanized, but especially the latter. Some manufacturers estimate that the increased consumption of their product this year amounts to not less than 50 per cent. Nearly all of them are many weeks behind in their orders, and their quotations must be regarded as largely nominal, inasmuch as deliveries within a reasonable time are admittedly impossible. In view of these conditions, jobbers with stocks from which deliveries can be made are naturally holding their prices very firm, and asking a handsome profit. In the West, where the line is a staple one and moves rapidly, quotations are lower than in the East, where the demand is lighter and stocks have to be carried a longer time. Some Western jobbers are quoting 28 gauge Painted Corrugated Roofing at \$2 per 100 sq. ft., f.o.b. Pittsburgh, but deliveries at these prices would doubtless be subject to the delays already referred to. Eastern jobbers with stock on hand are quoting the same product at \$2.65.

Sash Fasteners.—Leading manufacturers of Builders' Hardware have announced the withdrawal of prices on their general lines of Sash Fasteners. New quotations show advances of approximately 10 per cent. It may be remarked in passing that the effecting of this advance seems to indicate improving conditions in the market, inasmuch as this line is one on which low prices to competition have occasionally been reported.

Padlocks.—For some time past noteworthy firmness has been observed in prices on Padlocks of all grades. This has been largely due to the fact that manufacturers have been exceedingly busy, and in spite of the advance which took place in the fall Wrought Steel and Six Lever Locks and other grades on which competition is usually keenest have not been high enough to encourage cutting. Some makers are said to be in favor of higher prices for the general line, especially for the cheaper goods, believing that they are justified by increased manufacturing costs. Others are less enthusiastic, but if present conditions continue it may be that the market will show some advances.

Rope.—Since the first of the month a slight falling off in demand has been noticed, although no especial reason can be assigned for the diminution in requirements. No change in card prices has been made, yet low grade Rope is somewhat easier. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Spirits Turpentine.—The demand has been light at this point, as buyers are anticipating lower prices. The delivery of supplies now here is delayed on account of the freight handlers' strike, so that there is somewhat of a scarcity of Turpentine in this market. New York quotations are as follows, according to quantity: Oil Barrels, 67½ to 68 cents; Machine Made Barrels, 68 to 68½ cents per gallon.

Window Glass.—The market from the manufacturers' standpoint has no stability, and this condition is attributed to the number of factories which continue in operation, largely on sliding scales of wages (market money basis). It is also reported that the American Glass Company is still accepting orders at the cut prices it made during the last of March. Thus the future of the Glass market appears uncertain. Jobbers' quotations from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount on all sizes, single and double strength; outside of Greater New York, 90 and 5 per cent. for single, and 90 and 10 per cent. discount for double strength Glass.

Linseed Oil.—An advance of 2 cents per gallon has taken place in the price of Oil. This is not due to the demand in this country, as it is estimated that the consumption thus far in 1907 is about 25 per cent. below that for the corresponding period last year. The foreign demand for Seed has been largely above the average, and if exportation continues on the present scale it is anticipated that Oil may again advance in price. Contract Oil is being taken fairly well, but the demand for small lots is slow. Most of the large buyers have their requirements fairly well covered for the next month or two, so that the advance in price did not result in buying. New York quotations for jobbing lots are as follows, according to quality: City Raw, 44 to 45 cents per gallon; Out of Town Raw, 42 to 43 cents per gallon, according to seller. Boiled Oil is 1 cent a gallon over Raw.

THE BOSTON CONVENTIONS.

A ROUND trip rate of one and a third fare in some parts of the country and one fare in others has been granted by the railroads in connection with the coming annual conventions of the National Retail Hardware Association and New England Retail Hardware Association, which will be held in Boston during the week, June 17-22. Unusual courtesies will also be extended by the telephone and telegraph companies to those who attend the gathering. A number of special excursions have been arranged for to historical points in and around Boston, which will be in charge of competent conductors. A visit is also proposed to inspect the plant of the United Shoe Machinery Company at Beverly. The book which has been prepared as a souvenir of the occasion will probably be issued next week and will be extensively circulated. Any inquiries in regard to the meetings will be cheerfully answered by F. Alexander Chandler, 36 Federal street, Boston, who is secretary of the New England Association.

The C. H. Blanding Hardware Company, Harvey, N. D., recently incorporated with a capital stock of \$20,000, has taken over the business of Blanding & Fischer. The new company will handle a complete stock of Hardware, Harness and Furniture. The incorporators are C. H. Blanding, M. L. Blanding and H. O. Hanson.

On May 1 M. E. Gruber and Hatchett-De Camara Hardware Company, West Palm Beach, Fla., were merged under the corporate name of Lake Worth Mercantile Company.

Franklin County Hardware Company, Ottawa, Kan., has purchased the Hardware, Implement, Sporting Goods, Harness and Vehicle business of John R. McGuire.

Arne J. Higdem, Bagly, Minn., has bought the interest of his partners in the Hardware, Stove, Implement, Paint and Sporting Goods business which has heretofore been conducted under the name of Higdem, Heltna & Rugge.

JUDICIAL DECISION ON "UNFAIR COMPETITION."

THE United States Circuit Court of Appeals has lately rendered a decision which is of special interest and importance, relating, as it does, to "unfair competition," which term has been adopted by the law and the courts to designate cases where one manufacturer so closely simulates the style and appearance of articles made by another as to mislead or deceive the public as to the origin of the goods. This matter has not always received the attention which its importance demands, although one manufacturer not infrequently copies the goods of another so closely as to make it debatable whether or not this issue is involved.

In order to obtain a judicial decision in a case in which it appeared to the company this issue was plainly presented, the Yale & Towne Mfg. Company, New York City, filed a suit in the United States Circuit Court in November, 1905, against B. S. Alder, also of this city, agent for E. T. Fraim, Lancaster, Pa., in which the company set forth its belief that a certain Padlock made by Mr. Fraim was so closely patterned after one made by the Yale & Towne Company (No. 805) as to constitute a case of "unfair competition." As the company's business relations with Mr. Fraim have been and still con-

tinued supposing them to be the Padlocks of the plaintiff. Retail dealers and the trade generally will no doubt recognize differences, and are in no danger of being misled by any resemblance of identity between the articles, but the question is whether their customers, the ordinary purchasers who buy from the retail dealer, are likely to be deceived; and that they are we are thoroughly convinced.

Many of the features of the plaintiff's Padlock were separately a fair subject of appropriation by rival manufacturers, because they were not original with the plaintiff, but the plaintiff was the first to assemble them together in the concrete form in which its Padlock has become known to the public as its product; and while we cannot say that the appropriation by the defendant of this particular feature or that particular feature would have been unfair we can say that when all of the prominent ones have been appropriated and so assembled together, with slight variations in some of them, that altogether they produce the same general effect, and the ordinary purchaser would not be apt to discover the difference, enough appears to establish unfair competition. The defendant has, with a purpose, taken the design and dress of the plaintiff's Padlock. He has carefully copied it, differentiating his own from it in minor details, probably intending to escape the charge of infringement, but he has gone a step too far when he has produced a Padlock which to casual observation is substantially identical in appearance with the plaintiff's. His apparent purpose was to extend his trade with retail dealers and supplant the plaintiff's sales to such dealers by furnishing them



The Padlocks in Litigation.

tinued to be entirely cordial, this suit was one of friendly litigation, instituted solely for the purpose of determining certain questions of right concerning which opinions differed.

The case having been heard in the circuit court, a decision was handed down in favor of the defendant. An appeal was taken by the Yale & Towne Company to the United States Circuit Court of Appeals, which has reversed the decision of the lower court and rendered a decree in favor of the complainant. The members of the court, after a brief conference, rendered a decision in favor of the complaining company on the spot and without retiring.

This informal decision was delivered orally by Presiding Justice Wallace, a more full statement of the opinion of the court being given in the following written decision subsequently handed down:

We are prepared to dispose of this appeal now. In cases like this, where unfair competition in trade is charged, based upon the manufacture and sale by the defendant of an article in simulation of one previously put upon the market by the plaintiff, when specimens of the articles are before the court and there is no question of their authenticity, the court can judge of the resemblance between them, and whether purchasers are likely to be deceived by the resemblance, and the testimony of experts or of dealers is of little assistance. A comparison of the exhibits satisfies us beyond any doubt that the defendant has so closely copied the plaintiff's Padlock in form, size, coloring, lettering and details of finish that his articles are likely to induce purchasers to buy his

with an article which could be sold readily to customers as the article made by the plaintiff. When the defendant sold his Locks to the retail dealers at a considerably less price per dozen than that which they were obliged to pay for the plaintiff's Locks, he placed a strong temptation before these dealers to buy his Locks and increase their profits by selling them to customers wanting to purchase the plaintiff's higher priced Locks and we are constrained to believe it was intentionally and deliberately done and in order to increase his trade at the expense of the plaintiff's.

The evidence in the record shows a laxity of business morality among Lock manufacturers in appropriating the form, dress and general appearance of each other's products, which is not commendable, and which it is to be hoped does not exist in other trades; but this evidence and the argument based upon it cannot influence the court in a case where infringement is clear and the public are likely to be deceived, and they as well as the plaintiff are entitled to protection.

In accordance with this opinion the following final decree was entered in the United States Circuit Court upon the mandate of the Circuit Court of Appeals, definitely determining the Yale & Towne Mfg. Company's right to protection in the exclusive use of this style of Padlock:

It is hereby ordered, adjudged and decreed, that the decree of said Circuit Court be and it hereby is reversed with costs in this court, taxed at the sum of \$254.84, and in the Circuit Court, and that a decree issue enjoining the defendant, his agents, attorneys, employees, servants and workmen, and each and every one of them, from selling,

offering or exposing or advertising for sale, and from causing to be sold, offered, exposed or advertised for sale, the particular Padlock complained of in the bill of complaint herein, and of which "complainant's exhibit defendant's Padlock" is a specimen or any Padlock so similar to the Padlock of which "complainant's exhibit complainant's Padlock" is a specimen, as to be likely to deceive prospective purchasers as to the origin or manufacture of the same, and from applying to said Padlocks in advertisements, or in any other manner, the catalogue number 815 or any colorable imitation of complainant's catalogue number 805.

With a view to making entirely clear to the trade the issue involved in this interesting suit we illustrate herewith the two styles of Padlocks in question, one showing the No. 805 Ironsides Padlock, made by the Yale & Towne Company, and the other the Fraim Padlock, patterned after it. The similarity in color is not, of course, shown in the illustrations, although it had a bearing in the case. The essential characteristics of the Yale & Towne No. 805 Padlock, which, as alleged by the company, were reproduced substantially in the Fraim Padlock, were the following:

1. A case of distinctive shape, made of cast iron, in a black finish.
2. A square sunk panel on the side of this case containing the word "Yale" in raised letters of distinctive form. The Fraim Padlock had the same panel with the word "Yap" in raised letters of the same kind.
3. A shackle of bronze in bright finish, contrasting in color with the black of the case.
4. Raised bosses or "pillars" of bronze on top of the case to receive the ends of the shackle, thereby improving the finish and giving a characteristic effect.
5. The list number of the Yale & Towne Padlock, and long identified with it, was 805. The number selected for the Fraim Padlock was 815.

As the trade is aware, the internal construction of the two Locks is quite different, the Yale having pin tumbler mechanism (Yale system) and the Fraim Lock a warded mechanism.

Appreciating that the issue involved in this case has heretofore not been well understood, and that the point covered by the decision is more or less a novel one, the Yale & Towne Mfg. Company has voluntarily waived the question of damages in this case, but it is the company's purpose hereafter to seek full protection of the law against "unfair competition" in every form, and also for the protection of its various trade names and trademarks. Most of these have been in use for many years, are thoroughly established and are widely known.

So far as the production of the Yap Padlock is concerned it ceased to exist with that lettering about two years ago, when objection was made to its manufacture by the Yale & Towne Mfg. Company, on the institution of the friendly suit referred to above. The front lettering Yap was then substituted, but without further change of any kind in the appearance of the Lock or its mechanism, it still retaining the outline of a keystone on the back and "E. T. Fraim, Lancaster, Pa.," on the shackle as previously, the reverse symbol being emblematic of the Keystone Lock Works, of which E. T. Fraim is the proprietor. The same identical Lock is still manufactured, having the word Auto in the front panel in place of Yap or Jap, to which the Yale & Towne Company makes no objection.

Rabbideau, Turriff & Co., Depere, Wis., are successors to Rabbideau-Delwich Company, the interest of George Delwich having been purchased by Al. Turriff. It is the purpose of the new firm to largely increase its stock of Hardware and related lines.

J. C. Stevenson has succeeded to the interest of J. C. Wachob in the firm of Wachob & McLean, Hardware dealers, Tabor, Iowa, and the business is now conducted under the firm name of Stevenson & McLean.

The Newark Hardware Company, Newark, Ohio, has been organized to take over the business known as the W. L. Whitecamp Hardware store in that city.

King & Ransom, Colo., Iowa, have succeeded to the Hardware, Stove, Paint and Sporting Goods business of C. C. King.

HOLLEY-MASON HARDWARE COMPANY'S NEW BUILDING.

Spokane has long been known as a Hardware jobbing center, but its reputation has been largely a local one. The growth of the Hardware jobbing industry has been gradual. While Spokane has occupied a local field the field is not by any means a small one. It embraces 150,000 square miles, and covers eastern Washington, northwestern Idaho, northeastern Oregon and Southern British Columbia, an area three times as large as the New England States and larger than Illinois, Indiana and Iowa combined.

The most significant sign of recent years that Spokane is growing as a jobbing center is the erection and recent completion and occupation by Holley-Mason Hardware Company of its new reinforced concrete building. It was built at a cost of \$200,000. It is six stories high, with basement, and has a frontage of 150 ft. on Howard street and a depth of 150 ft. In connection with the main building is an iron and steel annex, two stories high, 100 x 140 ft., adjoining. The new building contains 150,000 ft. of floor space and the annex about 18,000 ft. These two together, and the two-story warehouse near-by, with a floor space of 30,000 sq. ft., gives the company a total floor space of nearly 200,000 sq. ft.

The first floor of the building is occupied by the general salesroom and office, the latter being on a balcony on the south side of the salesroom. On the first floor the concrete pillars are round, and are painted dark green 6 ft. high. The ceiling is 15 ft. high. These large columns, with the stretch of floor unbroken by partitions, and the large display windows on the front, present the most elegant salesroom in Spokane. On the second floor, the ceiling is 12 ft. high, and above the second floor the ceilings are each 9½ ft. high. The shelving is so arranged that it is not necessary to use a ladder.

The basement is occupied by Wire, Nails, Bolts and Heavy Material; the second floor by Sporting Goods and Builders' Hardware, and other small package goods; the third floor by Wagon and Carriage Hardware; the fourth by Stoves; the fifth by House Furnishing Hardware and Agricultural Implements; the sixth by full package and surplus goods of light weight.

The building is equipped with two electrical elevators, one 4-ton elevator of slow speed, and a 3-ton elevator with one-half passenger elevator speed of 125 ft. per minute. The building is heated by steam. With the exception of maple floors, which overlay the concrete in the salesroom and office and second floor, there is no wood construction in the building, which is considered absolutely fireproof.

The Holley-Mason Hardware Company was established in 1885, and is one of the oldest Hardware firms in the Pacific Northwest. F. H. Mason, the present president and manager, bought an interest in the firm in 1888. The firm burned out during the great fire in 1889. Seventeen years ago the company moved into the five-story structure recently vacated at 118 Howard street. At that time the stock of the company made 50 truck loads. The recent removal of the stock to the new building necessitated 1200 truck loads. The firm was formerly Holley, Mason, Marks & Co., but the name was changed some months since to the Holley-Mason Hardware Company. The firm has 110 employees and nine traveling salesmen. A loose leaf catalogue, containing 1420 pages, and covering an extensive line of Hardware in all its branches, including Stoves, Steam Goods, Wagon and Carriage Material, House Furnishing Goods, Cutlery and Sporting Goods has lately been issued.

The annual meeting of the Texas Hardware Jobbers' Association will be held in Galveston, May 17 and 18. R. F. Bell of the Wm. Henry & R. E. Bell Hardware Company, Fort Worth, is secretary-treasurer of the association.

The Warash Screen Door Company on May 1 removed its Chicago office to the Commercial National Bank Building.

Export Trade Topics.

PRACTICAL SUGGESTIONS ON EXPORT TRADE.

Fourth Article.—Receipt and Dispatch of Goods.

ARRANGEMENTS for the receipt and dispatch of export goods at New York form a strong argument for the maintenance of a New York office by out of town manufacturers. In the absence of such an office such manufacturers must either depend on export commission houses or be at the mercy of trucking, express or forwarding companies. The export houses are not forwarders, and will usually have nothing to do with goods for which they have not themselves placed the orders. In the absence of his own office the out of town manufacturer can probably do no better than arrange with some one of the numerous forwarding agents to take care of his export shipments. But he may as well understand first as last that these forwarding agents are not in business for their health alone. They will charge the manufacturer perhaps \$1 for a bill of lading, and they may even contract that that charge shall cover their entire profit on each shipment, for there is no charge made by steamship companies for blank copies of their bills of lading. Forwarding agents may agree to do the considerable amount of clerical work involved in writing numerous copies of bills of lading, custom house manifest and clearance for an inclusive charge of \$1, and to charge only exact cost for cartage and for prepaid ocean freight at lowest available rates.

But the event often, indeed usually, impeaches their good faith in this respect. It will almost always be found that the "best available" freight rates are not so good by a shilling or several shillings a ton as might have been secured; that cartage and insurance might both of them have been obtained more cheaply than called for by the forwarding agent's bill of charges. And when that bill is in turn charged by the manufacturer against his foreign customer there may be a protest forthcoming. The writer knows of one instance where the difference between the forwarding agent's charges and rates that might have been obtained, although small, amounting only to about 2 per cent. on the invoice price of the goods, was just enough to prohibit further orders in a certain line from that customer. Yet in the absence of any other or better arrangements the manufacturer can do nothing else than deal with a forwarding agent.

Our regular express companies fall into the same category when it is a question of export business. Their "express" service, as we understand the word, means nothing at all outside of the United States and Canada, which can scarcely be called an export market nowadays.

Foreign Parcels Post.

For the dispatch of very small packages, samples, &c., advantage may be taken of the parcels post service which the United States maintains with some but not all foreign countries. When it is desired to reach some countries not served by our own parcels post it is often convenient to have agents or correspondents in England, for our service reaches England and the English service reaches practically every part of the world. Thus it is possible to address a parcel to one's English correspondents, ask them to readdress to the required destination and affix the requisite amount of English postage stamps, and as free trade England imposes no duties on such parcels, the minimum of trouble is experienced with the maximum of speed in transit. The cost even of double postage will usually be found economical in comparison with other means of forwarding similar small parcels.

Ocean Freight Rates.

Almost every manufacturer who has had any export business to speak of understands the basis on which ocean steamships make freight charges. For the benefit of the uninitiated, however, it should be explained that freight is charged by steamships according to "weight or

measurement, at ship's option." The steamship basis is the English or "long" ton of 2240 lb., and in all ordinary cases 40 cu. ft. is regarded as equivalent to that weight. In other words, goods that weigh 56 lb. or more to the cubic foot are assessed freight according to their weight, and goods that do not weigh so much as 56 lb. to the cubic foot are charged per cubic foot at the same rate of freight they would have to pay were that their exact weight. That is 40 cu. ft. are called equal to 2240 lb. weight.

It requires but a moment's calculation for any manufacturer to realize that it needs a pretty solid and compact package of metal goods to weigh as much as 56 lb. to the cubic foot. Even iron safes measure more than they weigh, in steamship parlance. Hence, the great bulk of export shipments pay freight according to measurement, and it follows that the less space into which goods can be packed, the nearer the gross weight of the case can be brought to 56 lb. to the cubic foot, the lower the pro rata freight cost on those goods.

Heavy Pieces.

While on the subject of the weight of goods, it will be well to note the fact that very heavy single pieces, of machinery, for example, are usually assessed an extra rate of freight, and apart from that consideration, two points must be inquired into when making such shipments. Steamship lines differ in their regulations as to the acceptance of heavy pieces. Some lines will not accept any piece that weighs more than 3 tons. Other lines will not hoist at their own charge and risk or with their own tackle any piece weighing more than 1 ton. In such cases a floating derrick of sufficient capacity must be hired to proceed to the ship and perform the operation at an agreed upon charge per hour.

Similarly such heavy pieces are frequently assessed extra charges for unloading at port of destination or (which concerns the shippers) at port of transshipment, unless specifically contracted to the contrary in the bill of lading. A clear understanding should be reached in such instances, otherwise the unexpected expense will be of a very disagreeable nature to the shipper or to his customer. And it must always be remembered that the ship ton is of 2240 lb., and the "hundredweight" (cwt.) is therefore of 112 lb. Our commoner "short" weights are never used in foreign freight services; in fact, are not used at all outside of our own country unless in measuring American goods.

Primage.

Ocean freight rates are quoted in Sterling—that is, in pounds, shillings and pence—and this not alone in the case of purely British vessels, but even by the German lines, and very generally throughout the world. Some lines insist that freight be prepaid. With others it can follow the goods and be collected at the other end. The manufacturer may at first be puzzled by the term "primage." Briefly, a rate of freight may be named as 20 shillings per ton, weight or measurement, and 5 per cent. primage. This means that in addition to the freight rate named 5 per cent. of that rate will also be charged; thus in the case named the actual rate paid would be 21 shillings. Primage was originally the sum paid to the ship's captain for careful loading and handling, but has nowadays been appropriated by the steamship companies or their agents; may, in fact, be regarded in a way as the commission of the agent.

Minimum Bills of Lading.

The objection to shipping small lots of goods arises from the fact that steamship companies usually have a limit below which they make a uniform charge. This is called a "minimum bill of lading." Some lines will issue a "minimum bill" for 1 ton, weight or measurement, other lines charge the same for all amounts less than 3 tons, i. e., 6720 lb. or 120 cu. ft. Thus, if a single case of goods only be shipped, measuring, say, 27 cu. ft. and weighing 500 lb., the freight charge would be exorbitant in comparison with the pro rata charge were this case included with many others, altogether making up a "minimum bill" or more. It is one of the functions of

the forwarding agents to combine such small shipments and one of the ways in which they make profits.

As a rule, it will be found cheaper to hand similar small shipments, not sufficient in themselves to constitute a minimum bill of lading, to forwarding agents rather than attempt to ship separately on an individual bill. However, quotations of rates should in all such cases be obtained from several competing forwarders, for prices demanded will depend on what other parcels each one may have going forward to the same destination, a constantly variable quantity.

(To be continued.)

PENNSYLVANIA BILL FOR BRANDING PAINTS, Etc.

IT is expected that the Pennsylvania Legislature will shortly pass a bill providing regulations for the manufacture and sale of Putty, Turpentine, White Lead, Paint and other substances used for manufacture of Paint and placing the inspection in the hands of the Secretary of Agriculture. There were two bills with this end in view presented in the houses, and the Senate bill was amended so as to conform with the House bill, thereby eliminating some of the objectionable features.

The bill requires proper branding of the articles, there being a provision which permits manufacture and sale of imitations under the requirement that they be so designated. As to Paints, the bills provide that manufacturers and dealers must have on the package labels giving the name and location of the manufacturer or distributor, the net weight or volume of the contents, the names and percentage of the ingredients, solid and liquid, provided that in the case of other Paints than white the ingredients other than the coloring material may be treated as forming the whole or 100 per cent. of the Paint, in which case it shall be necessary to clearly and plainly state on the label, not only the names and percentage on that basis of such ingredients in the Paint, but also the names and quantitative chemical composition of the coloring materials. The term Paint in the bill is held to include White Lead, colors in oil and oil compounds.

The bill makes possession by any firm dealing in such articles of any materials improperly or not branded *prima facie* evidence that the material is kept for sale.

The proposed law is to take effect on January 1, 1908, and prosecutions may be brought before any magistrate. First conviction is punishable by fine of from \$50 to \$100, or imprisonment, and in addition costs of legal proceedings and analysis. Subsequent conviction is punishable by from \$100 to \$500 fine and costs, or imprisonment. While the magistrate is given power to impose fine there is provision for appeal to the courts. In many respects the bill follows the present law relative to the prosecutions for sale of adulterated or misbranded foodstuffs.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

MARLIN FIRE ARMS COMPANY, New Haven, Conn.: Illustrated circular referring to Marlin Model No. 20, .22 Caliber Repeating Rifle, with trombone action.

M. M. BAKER & CO., Peoria, Ill.: Illustrated catalogue F, entitled "Odds and Ends for the Thrifty Dealer," referring to an extensive line of Tools and Supplies for the Implement, Vehicle and Hardware trade.

LIBRARY BUREAU, Boston, Mass.: Handsome brochure containing illustrations of offices, banks, &c., equipped with its Steel Furniture, Filing Cases, &c.

BILLINGS & SPENCER COMPANY, Hartford, Conn.: General catalogue illustrating and listing an extensive line of Machinists' Tools, referring also to drop forgings of all

descriptions in copper, bronze, iron and steel; also illustrated catalogue of Fine Tools and Specialties, including Jewelers' Anvils and Bases, Caliper Gauges, Hand Vises, Key Rings, Combination Knives, Micrometer Holders, Steel Rules, Snap Hooks, Surface Gauges and Tack Hammers.

BUTLER BROS., Randolph Bridge, Chicago: Midspring issue of catalogue, "Our Drummer," referring especially to Notions and Fourth of July goods.

NORWICH NICKEL & BRASS COMPANY, Norwich, Conn.: Illustrated catalogue No. 15 and price-list of specialties and novelties for window and interior display, Individual Stands, Cornice Fixtures and Display Frames for shoe and dry goods merchants, hatters, haberdashers, outfitters, &c.

J. W. DUNHAM & SON, Berea, Ohio: Illustrated catalogue No. 21, entitled "359 Land Preparers," referring to Rollers, Soil Pulverizers, Harrows, Plows, &c.; also catalogue No. 22, referring to Hand or Horse Rollers, for lawns, gardens, tennis courts, golf links, &c.

CHAMPION THRESHER COMPANY, Ottville, Ohio: Illustrated booklet of specifications, &c., referring to Separators, either plain or accompanied with Clover Hullers, Wind Stackers, Self Feeders, Grain Registers, Dust Collectors, Water Tanks, &c.

KINGERY MFG. COMPANY, Cincinnati, Ohio: Catalogue of Soda, Ice Cream, Peanut, Popcorn and Candy Venders' Machinery and Supplies.

HOOSIER DRILL COMPANY DIVISION, American Seeding Machine Company, Richmond, Ind.: Illustrated catalogues referring respectively to Seeders, Grain Drills and Corn Planters, Corn Drills and Cotton Drills.

M. C. PIERCE SPECIALTY COMPANY, Beloit, Wis.: Booklet and circulars referring to Belvidere Carpet Stretcher and Tacker, Garment Hangers, Tack and Stub Pullers, Combination Lifter, Tongs, Plier, &c., and other household specialties.

GOSHEN BUGGY TOP COMPANY, Goshen, Ind.: Illustrated catalogue for 1907, referring to Carriage Trimmings, Hardware and Wood Stock, and Blacksmiths' and Wagon Makers' Supplies.

MAINE MFG. COMPANY, Nashua, N. H.: Attractively illustrated booklet referring to Stone White Refrigerators.

CHARLES E. MILLER, 97-101 Reade street, New York: Illustrated Automobile catalogue No. 9, for 1907, containing list prices on Motor Car, Motor Boat and Motor Cycle Parts, Fittings, Supplies and Sundries. This is one of the largest catalogues of its kind published and covers an exceptionally complete line of these goods.

R. HERSCHEL MFG. COMPANY, Peoria, Ill.: Illustrated catalogue No. 63, with price-list, referring to Mowers, Reapers, Sickles, Feed and Corn Cutters, Corn Harvesters, Haying Tools, Spring Keys and Cotters, Coil Springs and other Agricultural Implements and Supplies.

COOPER & MCKEE, Brooklyn, N. Y.: Attractive illustrated catalogue and price-list showing their line of Opalite Glass Lined Refrigerators.

STUDEBAKER BROS. MFG. COMPANY, South Bend, Ind.: Catalogue No. 262, for 1907, an illustrated trade edition of imposing size and scope, referring to Carriages, Wagons and Vehicles of all kinds.

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y.: Illustrated catalogue of Hand, Horse and Motor Lawn Mowers, referring also to Lawn Mower Grinder, Grass Catcher and Horse Boots.

KEYSTONE FENCE COMPANY, Peoria, Ill.: Catalogue No. 16, profusely illustrated, together with circulars referring to Farm and Lawn Fence, Gates, Fence Stretchers, &c.

The business of the Otto Hardware Company, Wapello, Iowa, has been purchased by Fred H. Hesse and Lloyd Patterson, and is now conducted under the firm name of Hesse & Patterson.

Troy E. Schultz has bought the Tin, Sporting Goods and novelty store of S. B. Vickers, Mannford, I. T.

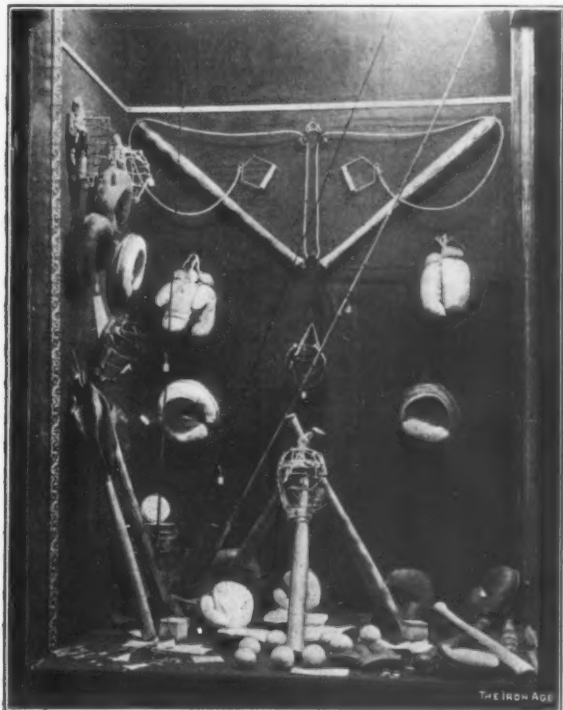
TRADE WINNING METHODS

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

BASEBALL GOODS

WINDOW DISPLAY.

SPORTING goods are capable of very artistic and attractive arrangement, and displays of these lines are always popular with the public. There is no class of customers who are more enthusiastic over their paraphernalia than sportsmen, and any trouble encountered in displaying this class of goods will be amply repaid if the best of this trade can be secured. The opening of the baseball season was recognized by the E. N. Howell Hardware Company, Dixon, Ill., by the window display



Baseball Window of E. N. Howell Hardware Company.

shown in the accompanying cut, which occupied the smaller of the two windows at the disposal of the company, which is 5 ft. wide. In the window shown the bats, mitts, masks, baseballs, &c., were accompanied by a little Fishing Tackle by way of timely suggestion to another class of sportsmen, while a set of Boxing Gloves and an Elastic Exerciser were also included without disturbing the general harmony of the athletic suggestion. The floor of the window was covered with black calico, as was also the back and left side up as far as the rail. From there to the ceiling dull red was used to provide an agreeable contrast.

HARDWARE MERCHANTS' PRINTED MATTER.

THE second number of the house bulletin issued by John Mackey & Son, South Haven, Mich., is entitled "Spring and Summer Goods." It contains 12 pages of matter relative to Paints and Varnishes, Hammocks, Baseball Goods, Fishing Tackle, Tennis Supplies, Garden Tools, Lawn Mowers and Sprinklers, Gas Stoves, Refrigerators, Screens, Incubators, Fencing, &c. The bulletin is well printed on paper of good quality, so that the numerous cuts used show up to good advantage. Announcement is made that an Asbestos Mat will be given free to the ladies who fill out the coupon which appears in the bul-

letin and bring it to the store. House builders are also reminded that the company's stock of Builders' Hardware contains a good assortment, and that the firm is in a position to offer attractive figures on contracts.

THE SALISBURY HARDWARE COMPANY, Salisbury, Md., handling Shelf and Heavy Hardware at wholesale and retail, sends out to its customers a card that will be valued by them for the information given in regard to quotations on certain lines. These include Plows, regular sizes of Nails, Axes, several styles of Files, Wrought Pipe, Rope and Field Fencing. The card is 11 x 6½ in. in size, and is illustrated with an exterior view of the company's double building, with entrance in the center and two show windows on either side.

TRADE ITEMS.

THE NEW YORK STATE RETAIL HARDWARE ASSOCIATION, J. B. Foley, Syracuse, secretary, has issued a full report of the proceedings of the fifth annual convention at Syracuse, February 19-22, in the form of a well printed volume containing 100 pages. Portraits are also presented of the officers and directors, as well as a list of the members and a list of the Hardware exhibitors at the convention, some of the more elaborate displays being touched on at length. A copy of the book has been mailed to the members and to Hardware merchants generally throughout the State.

In addition to the consideration and discussion of live and practical trade subjects an entertainment programme has been provided for the annual meeting of the Retail Hardware Association of the Carolinas, to be held at Charlotte, July 9, 10 and 11, headquarters at the new Selwyn Hotel, which should prove interesting and enjoyable to those who attend the convention. The programme covers a reception at the Commercial Club, carriage drives to places of interest in Charlotte and vicinity and gun prize contests, one for the best shots among the visiting merchants and the other for professionals. Space has been provided for Hardware exhibits, and manufacturers and jobbers are invited to take part. Reduced rates on the railroads of the two States have been granted, and a large attendance of merchants is looked for. Elliott Dunn, third vice-president of the association, Charleston, S. C., who is in charge of the publicity end of the coming convention, will be pleased to respond to any inquiries concerning the meeting.

THE WINSTED EDGE TOOL WORKS, Winsted, Conn., has appointed John H. Graham & Co., 113 Chambers street, New York, agents for the sale of the T. H. Witherby Chisels, Gouges and Drawing Knives in the United States east of Denver and for export. John H. Graham & Co. will make quotations, receive orders and act as the company's representatives in a general sales capacity.

Dixie Hardware & Furniture Company, Limited, has been incorporated at Gibsland, La., with a capital of \$30,000. The company is about to build a large two-story brick building and will handle Hardware, Furniture and allied lines, wholesale and retail.

The retail Hardware firm of Moore & Tobin, Mankato, Minn., has dissolved partnership; E. J. Moore, who bought Mr. Tobin's interest, becoming sole proprietor. The business will be conducted on the same lines as in the past.

The stock and building belonging to Rohrbacher & Allen, Akron, Ohio, wholesale and retail Hardware and Factory Supplies, was recently destroyed by fire. The loss sustained was partially covered by insurance. Business was immediately resumed in temporary quarters secured at 63 South Howard street.

The Bourland & Moore Hardware Company, a new firm, has opened a store at 518 Main street, Evansville, Ind., where it will carry a complete general line of Hardware. The members of the firm are R. E. Moore, H. D. Bourland and F. T. Wallace.

Hardware Window Display

FIFTH ARTICLE.

IT would be instructive to watch the effect produced on pedestrians in a city by an attractive, interesting window and one which has the opposite characteristics. The contrast is startling, and it is remarkable how judicious window displays seem to meet with the quick response from the general public in the way of an interested examination. One has only to walk a few blocks through some popular thoroughfare to get the effect produced by the various store windows.

Indefinable Attraction. Sometimes the attraction is indefinable, but still it is there. Sometimes the cause of one's interest in a certain display is obvious, on account of some special feature of novelty or beauty which is prominently brought forward. An experienced business man once said in this connection: "More people are reached by an attractive display which appeals to the eye than by argument which appeals to the reason or even by low prices which appeal to the pocket." Many ideas may be gathered by an observant Hardwareman from a general and even cursory examination of the window display methods employed by merchants in other lines of business, whose ideas may be modified to suit his own goods.

Prices in Windows.

An extensive canvass of retail merchants shows that there is no little difference of opinion as to the advisability of marking prices on goods displayed in the show window. Especially at holiday time it is declared that advertising prices is bad policy, for the reason that purchasers of gifts do not wish the amount which they pay to be generally known. The point is also made that if prices are marked on competitive goods passers-by are likely to carry them in mind and competitors are likely to use them in secur-

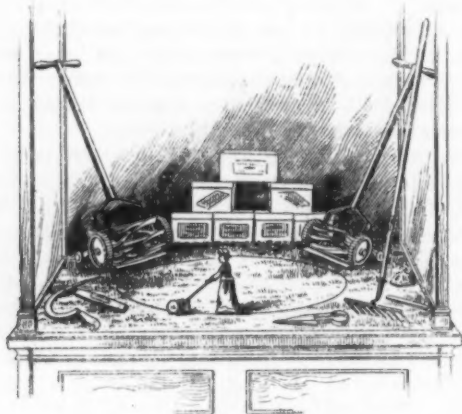


Fig. 12.—Miniature Lawn Mower and Operator, Run by Electricity.

ing trade by slightly underselling. On the other hand, it is pretty generally agreed that on goods controlled in the locality or on novelties and specialties the presentation of prices is likely to add to the interest as well as to the practical results of a display.

Seasonable Displays.

There is perhaps no more remunerative or satisfactory style of display than that referring to a seasonable line of goods—that is, a line prominently suggested by the time of year or by some form of activity temporarily common to the people of the community. Samples of these lines of which effective displays can be made will readily occur to any merchant: Garden Tools in spring, Lawn Mowers, Sickles, Garden Hose, &c., at the opening of summer, Skates and Sleds in winter, &c. Many mer-

Symbolic Displays.

chants add to the interest of their windows and keep them up to date by making symbolic displays referring to timely subjects or to anniversaries as they come around. Washington's Birthday suggests Hatchets; Fourth of July, Firearms and Ammunition; Thanksgiving, Carving Sets, Table Ware, and so on.

Display of Lawn Mowers, Etc.

Fig. 12 affords an example of a seasonable display devoted to Lawn Mowers and Garden Tools. In the background are a couple of machines set up with a pile of labeled boxes, which need not necessarily contain Mowers. In the foreground are Sharpening Stones, Rakes, Grass Shears, &c. The window is filled with imitation grass made of green paper, and the realistic effect may be increased by the use of small shrubs and plants. The feature

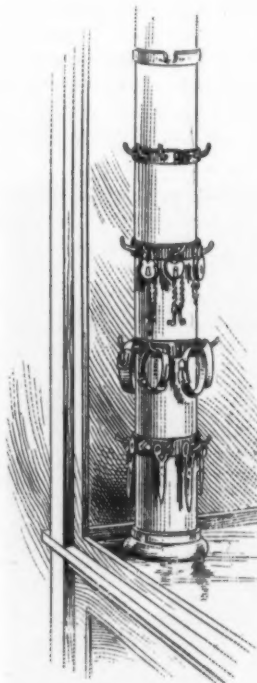


Fig. 13.—An Obtrusive Post Utilized.

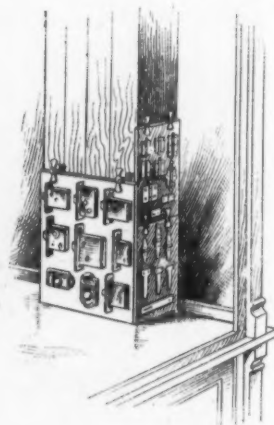


Fig. 14.—Removable Sample Boards for a Window Corner.

of the display, however, is the miniature woman operator pushing a Mower of proportionate size, which can be arranged to move slowly around in an elliptical course by the use of a small Electric Motor hidden behind or underneath the window.

Unightly Posts, Offsets, Etc.

When a post obtrudes itself into the front or background of a show window it can often be used to good advantage. One method is shown in Fig. 13, where metal bands are bolted around a post with projecting hooks on which may be hung Dog Collars, Padlocks, Scissors, Shears, and many other lines of goods, the arrangement of which can of course be changed from time to time. Some merchants make use of awkward angles, corners and offsets in their windows for the display of removable sample boards, which can be made interchangeable and fastened in place with buttons, as in Fig. 14, or with Hooks and Eyes. The boards should be painted or covered with some cloth material, such as has already been referred to. By this plan it is possible to replace any line of samples by removing the separate board to which they are attached without damaging the entire display, and all the sample boards can be removed and the space used in other ways if desired.

(To be continued.)

THE BOSTROM-BRADY MFG. COMPANY, Atlanta, Ga., manufacturer of the Bostrom Improved Levels, has arranged with the Palace Hardware Company, San Francisco, Cal., to act as agent for the sale of these Levels. The business of the company in that section of the country has reached such proportions as to make this step necessary.

TRADE IN THE PHILIPPINES, COCHIN CHINA AND FEDERATED MALAY STATES.

BY JOHN L. SARDY.

(Concluded.)

FEDERATED MALAY STATES.

LEAVING Saigon the cargo steamer lands its passengers in Singapore in three days, a run of 680 miles. Singapore is really in Malaysia, which consists of three British settlements, known as the Straits Settlements. These are composed of Singapore, an island 26 miles long by 14½ miles wide, situated less than 2 degrees north of the Equator; Penang, also an island, which, however, takes in Wellesley Province on the main land of the Malay Peninsula, and the third is the settlement of Malacca. The States known as the Federated Malay States include Perak, Selangor, Pahang and Negri, Sembilan, and still have their native Sultans, who possess absolute power as to affairs Mohammedan, but the real government of the country is under British control, and the Governor of the Straits Settlements at Singapore is directly responsible to the home government in England.

Railway Development.

Railway development is gradually going ahead in the States. Nearly 500 miles are now in operation, which sounds small in the United States, but means a lot in the Malay States, especially as the money has been provided there. The lines are under control of the Federated Malay States Government and the equipment is English throughout, purchases being made through the Crown agents in London for account of the Malay States. In the course of about two years it is said a direct line will be in operation, running through all the States, including the settlement of Malacca and the State of Johore, which is governed by its own Sultan. It is a rich land which the new railway will serve to open up and bring in much needed capital.

Trade and Shipping Centers

Singapore and Penang are the trade and shipping centers. The principal import business consists of European and American Machinery, Tools, Hardware, Cotton Goods, &c., of which the greater part comes from England. There are a number of saw mills in Singapore, in all of which British machines are used, as they are better understood than American and therefore preferred. Very likely the British manufacturer has made it his business to have his machines understood, while the American maker has been too busy at home to bother about it. There is practically only one American Saw sold here, a well-known make.

The chief industries in the Federated Malay States are the cultivation of rubber and tin mining; there are also a few small gold mines.

Plows and Cultivators and Their Introduction.

Plows have never been used until recently, except the crude wooden home made article used in the marshy paddy lands, where it is under water most of the time. The introduction of imported Plows came about in this way: There is a rubber estate called Tampin Linggi, the manager of which had a large tract of lalang grass grounds to clear. He conceived the idea of using Plows and Cultivators, and proceeded to carry it out by importing from England Plows, Harrows and Cultivators to clear the land. The experiment, if it can be called an experiment, was of course successful, and other rubber planters, being impressed with the result obtained, placed their orders for the implements and now Plows, &c., are beginning to come into the States. This is all quite recent. Canadian and Australian Plows are preferred, and with the exception of one or two samples held by an American agency house in Singapore no American Plows have come in at all yet.

Not long ago an exhibition was held in Singapore principally for the benefit of the rubber industry. Sev-

eral Plows were exhibited, and planters at once bought them, and if stocks had been on hand the chances are many would have been sold, consequently importers are now giving their attention to this business.

Bangkok should also be a good field for Agricultural Implements, as the Siamese Malay States, consisting of Kelantan, Tringanu, Kedah and Tongkah, will be open for rubber cultivation before long, and the ground will have to be cleared; hence in due course a market should exist for implements.

Portable Engine and Boiler Combined.

Whenever a small tin mining venture is floated in the Federated Malay States almost the first thing the promoters buy is an English Portable Engine and Boiler combined, generally from 10 to 12 hp. This Engine is different from anything made in America. The firebox on the American Engine is too near the ground for a rough country like this. The Engines used are adapted for burning either coal or wood, the latter being the fuel generally used. Each Engine is equipped with a centrifugal pump, belt driven from the Engine flywheel.

American Two-wheel Buggies are somewhat extensively used on the plantations, not only in the Federated Malay States, but also in Sumatra, and the better varieties with hoods are used in the small townships.

A Fine Field for Motor Cars.

The country is a fine one for motor cars, although there are only about 50 in use at present, but steadily increasing. French cars are the ones mostly *en evidence*, but in Singapore itself an American car appears to be the favorite. A French motor car firm saw an advantage in forming mail and passenger service by means of motor cars through outlying districts, and have carried out the scheme by running several routes from various railroad termini, one of the principal being from Kuala Kubu to Raub.

Jinrikisha Still Holds Its Own.

The two-wheeled passenger vehicle of one man power, known as the jinricksha or jinrikisha, commonly called the 'ricksha, steadily holds its sway in spite of motor cars, bicycles, horses and bullocks. It is not only uncomfortable, but the collisions which happen now and then make it more or less dangerous. It is cheap and popular, however, and what the East would do without it is more than man can tell. In Singapore the authorities are very particular about the public 'rickshas. Every one is registered and is inspected by a municipal officer every four months. This inspection is very thorough, and if the vehicle is not in proper running order it has to be made good by the owner, who is generally the runner. When a 'ricksha is condemned the owner's license is taken away from him, and he can only have it renewed by coming before the registrar with a vehicle in proper condition. The registration fee or tax is 12 Singapore dollars per annum, say, \$7 United States currency, payable in four installments during the year.

Every part of the vehicle is numbered, such as hood, shafts, wheels, apron, cushion, &c., and woe betide the runner who tampers with these numbers. He not only loses his license and thus his means of livelihood, but is made to publicly bow down and salaam over and over before a stern municipal officer and literally grovel in the dust before him. The owner of an irretrievably condemned 'ricksha sells it for the best price he can get, but, of course, it cannot be used in Singapore again, so it usually goes to the Malay States.

All the 'rickshas are made in Japan. The wheels with rubber tires, however, are imported from America. Each 'ricksha has two lamps, which are also made in Japan. The average life of a well made 'ricksha is from five to six years. A vehicle of the first class costs about \$60 and of the second class about \$30 each United States currency. There must be over a million of them in use in the East. In Singapore alone there are over 7000, requir-

ing 21,000 coolies or 'ricksha runners to haul them, the custom being to have three runners taking turns on each 'ricksha. The first-class fare is 6 cents per mile, or 24 cents per hour; second-class, about 4 cents per mile, or 12 cents an hour. A first-class runner earns about 90 cents and a second-class about 50 cents per day, the figures given being United States currency. They are all good runners, but those in China, the States and other Eastern places cannot be compared for a moment with the Japanese, who is the finest long-distance runner in the world.

British Goods Much in Favor.

Singapore is the most important place for business and Penang comes next. Occasionally Kuala Lumpur, the capital of the Federated Malay States, is visited by foreign travelers for business, but not often.

Singapore being a sort of halfway house between Japan, China and India, a good many American commercial travelers stop there, but most of them carry too many lines and cannot do full justice either to their principals, their customers or themselves. English travelers usually have fewer lines and do better, besides it must be understood that a natural tendency exists in favor of British goods, not only the territory but pretty well all the capital employed there being British.

Another reason for this preference is the time saved in ordering goods from England, instead of from the United States. Many importers who used to buy American goods freely are now content to pay more for an English article, which they can obtain in a comparatively short time, rather than wait six months for goods from America. The blame for this is cast upon our manufacturers, whether justly so or not.

Another complaint is about American catalogues and complex systems of discounts. They do not like to bother with half a dozen discounts from a list price, and greatly prefer a plain and simple list which can be easily understood. In this respect the English catalogues are found more suitable.

Circumventing the Chinese Boycott.

The Chinese boycott against American goods has by no means died out in the Federated Malay States. The rich Chinese tin mine owners simply will not buy anything knowing it to come from America; they even go so far as to include Canada in this restriction, hence there is only one thing to be done by the importers of articles which must come from America, and they do it, viz., obliterate any name or indication of origin. Even machines with the maker's name and address cast on the iron part are treated in the same way, the letters being chipped off and the place painted over. Thus in a way is the motive of the boycott overcome and the Chinaman deceived, but the importer does not like it, and although he doubtless finds certain advantages in handling American Hardware and other goods, the boycott and slow deliveries certainly hamper our trade in this part of the great circle dividing the northern and southern hemispheres.

E. BISSELL & Co., auctioneers of Hardware, Housefurnishings and related goods, have removed to 5 and 7 Mercer street, New York, one block west of Broadway. The firm has occupied its present warehouse at 12 Murray street and 15 Park place for 21 years and is compelled to move because of the demolition of the building to secure a site for a new structure about to be erected. This house has long been favorably known in connection with the selling of Hardware and kindred stocks to the trade, and the senior partner, Eugene Bissell, was recently elected president of the Hardware Club of New York.

NORRIS & MARSHALL, Pell City, Ala., have recently commenced the manufacture of one-piece Shovels of all kinds and Draining and Ditching Tools. They are also manufacturing Crucible Cast Steel Surface or Self-Sharp-ening Shovels.

AN EASTERN MERCHANT'S VIEW OF CALIFORNIA.

BY A. C.
(Concluded.)

LOS ANGELES provides anything one wishes in the Hardware line—from the department stores carrying lines of Enameled Wares, Cheap Tools and Kitchen Furnishings, to the exclusive Cutlery Tool or Sporting Goods establishments. Owing to the proximity of the deep sea fisheries at Santa Cataline Islands, the latter stores are equipped with elaborate and costly apparatus for landing the gamy tuna, some of the wealthy tourists with sporting tastes freely paying from \$100 to \$150 for Rod, Reel and Line. Some of the grocery stores carry fair stocks of such Hardware as appeals to the housekeeper, at a smaller margin of profit than the Hardware stores.

Prices in Plain Figures.

When anything out of the ordinary happens in the course of trading in the experience of the newcomer, the incident is marked against the California dealer, who is charged with pouncing upon the newcomer or tourist, as his legitimate prey, to be fleeced at will, when if the same incident occurred in his home town, it would pass as coming in the natural order of buying and selling.

The following is an incident in point: A newcomer wishing to provide his home with a long list of articles, went to a Hardware store, carrying a letter of introduction from an Eastern jobber. Before presenting his letter he inquired the price of several articles from the clerk. Then showing his letter, by virtue of which he was supposed to obtain a concession in price, one of the office men turned to his price book, and confidently told the newcomer he could have the Garden Hose he had selected at 14 cents a foot, which was 1 cent more than the clerk had asked in the regular way. The clerk said he had read the ticket wrong. The newcomer, however, took his list to another store. This goes to show that, everything else being equal, the most satisfactory store for the general public is, without doubt, the one that marks the selling price in plain figures.

An Outside View of Merchandising.

From the nature of his environments, the Hardwareman is educated to look at store problems at close range or from the inside. If he can occasionally change his position—free himself from the point of view of a storekeeper—and look at merchandising from the outside, both his business and himself will profit thereby. If he cannot throw off all the cares of business by a long vacation, let him rid himself, to a great extent, of that narrowing store sense by doing some of the retail buying so generally given over to the wife.

If he took a long vacation in southern California, he would in all probability have some experience like the following. His itinerary may include a few weeks' sojourn in a furnished cottage. He discovers that the landlord's definition and his of "furnished" are not taken from the same unabridged. So he walks forth one morning provided with a list of necessities. He is in a place where he is entirely unknown, and walks forth free to buy where he will. For once he feels he does not have to go to so-and-so because so-and-so at one time bought a pound of Nails from him. He hardly knows where to go. The local papers containing the advertisements have no interest for him, so it may happen that such a little thing as calling at the post office determines the store where his purchases will be made. On his list he finds among many other items: Egg Beater, Meat Cutter, Fruit Press and Razor Hone. His instructions are so definite about the kitchen articles that he is fortified against anything "just as good."

Hardware and Groceries.

Walking along with his eyes open, he sees a window display that attracts his attention. The window is deep, and arranged with narrow shelves, terraced, rising

toward the rear. On the bottom of the window is a row of Wringers with the price on a large ticket. He thinks \$2.95 not bad for the Wringer so marked. On the shelf next above is a dozen or more Meat Cutters for 95 cents. The next shelf is filled with Cutlery. The next with Enameled Ware, and the last with Tin Ware, all plainly marked. He is on the point of going into the store when a big placard in the other window,

"Prunes 5c. a pound"

halts him. His "store sense" rises prominently, and bars the way, demanding what right has a grocery store to handle Hardware? But his freedom from the store also asks why pay \$1.25 for a Meat Cutter at a Hardware store, just because it is a Hardware store?

He enters, finding a large room with groceries on the right and Hardware on the left. A brisk business is doing, so it is some time before he finds a clerk to wait upon him, which gives him an opportunity to note that the fixtures, cash carriers and store system in general seem well appointed. Presently a clerk approaches from the grocery department. After his purchases are made and the clerk hands him a copy of the list, priced and footed, he calls the attention of the clerk to the Cutter priced \$1.25. The clerk goes to a pile of them, showing the tag in plain figures, \$1.25. The window? Certainly. The two walk outside where the price, "95 cents" in large print confronts them. The clerk explains that the trimmer had just finished the window and not notified the clerks of the change of price. This appears reasonable, only he thinks if he was running the store he would manage differently.

A Razor Hone Experience.

The next store he enters is small. He is approached at once and to his inquiry for cheap Italian Hones, the clerk very politely responds in the affirmative, displaying a line, the cheapest being marked \$3. Insisting upon a cheap Hone, the clerk pushes toward him a box of oil slips! He is for the moment inclined to think the clerk is taking liberties, but his ingenuous manner disarms the suspicion. He leaves the store making comparisons, which are odious, but on the whole well pleased with his experience.

Native Californians Very Scarce.

In the East he had been led to believe that Californians, like the climate, were different from others—that they were a species of mercantile cannibals living off the tourist. After he is here a while he finds them nearly, if not quite, human, coming as they do from every State in the Union. There are few Californians in the sense of New Yorkers and Ohioans, who are born in the State. The newcomer is he who came yesterday. The old resident has been here a year, while the oldest inhabitant prides himself on a record of 15 years. In one of the convention towns at the seaside the request was made before an audience of 4000 people for all native born Californians to rise. In response 40 people proudly received the admiring gaze of the audience.

The merchant finds his customers continually changing, as many people leave their homes in the East to spend a winter free from ice and snow. These conditions affect the business methods. The familiar sign of the Beehive, New York or Boston Store gives place to signs reading, "The Missouri Hardware Store," "Kansas Realty Company," or the "Arkansas Barber Shop."

The Climate and Season Goods.

The Hardwareman from the East wonders how the California Hardware dealer gets along without the demand for seasonable goods, as in the winter, Sleds, Skates and Stoves. He discovers that what he does not know about the climate would fill volumes. After the winter rains, ending in March or April, there is no rain until November or December. This makes a large demand during the summer months for Garden Hose and Lawn Mowers. It is no unusual sight to see Mowers on the pavements as late as November. From the latter part of

December cold snaps occur, the thermometer falling as low as 28 degrees as an extreme, while from 30 to 38 is quite common. He may be told that the winter rains come only in the night and that the sun shines some time every day. He learns by experience that when it rains it rains, keeping it up or rather letting it down for three days at a time. He may be found hustling around for coal at \$13 per ton, short weight, or wood at the same price per cord, to feed his little Sheet Iron Stove. When sufficiently warm he opens "Our Italy," underscoring such passages as "Artificial heat is never required."

The facilities provided for comfort and manner of building houses, with up and down boards, the cracks covered with battens, and walls unplastered, might answer as temporary expedients in pioneer days. Well built houses with good facilities for heating are as essential as in the East. The Easterner demands these things and having the money to get what he wants makes business for the Hardwareman. Consequently all kinds of heating devices are growing more and more in demand, particularly gas appliances. The story is told of a lady from the natural gas belt rejoicing that she was away from that "dirty, stuffy heat," to find that 90 per cent. of the residents use gas as a fuel.

Transforming a Sheep Ranch.

Twenty-five miles from Los Angeles is a town where the conventionalities of the big cities is just coming. Here is found one of those marvels of the West—a prosperous town of 20,000 people, with asphalt streets, efficient fire department, electric car service, five banks, three department stores and eight Hardware stores. Twenty years ago it was a sheep ranch; five years later a growing town developed, but trade was yet so dull that the Hardware clerks pitched Horseshoes between sales on the main street. Yesterday the citizens raised, by popular subscription, \$100,000 to secure a manufacturing plant from the East. The advance in real estate and development in business opportunities has made many men rich, who have not had time to adjust themselves to their new position, and who cling to the style of dress in vogue when barley fields occupied the best residence district. They gratify their starved tastes by wearing the heaviest watch chains and largest diamonds money can buy.

Woman Clerks in Hardware Stores.

Here the Hardware stores take on an individuality not found in older settlements. In one you are approached by women clerks who show Builders' Hardware and Tools with the same unconcern they would ribbons. The peculiarity of women clerks is not confined to the Hardware stores. Barber shops with female tonsorial artists are quite common. But for the unusual, this town leads with a meat shop where a woman of the physique of Hugo's Madame Thernadier wields Meat Saw, Butcher Knife and Cleaver—weighing her hand along with the meat—with the neatness and dispatch of a skilled butcher.

Shin Plasters and Coins in Window Display.

In another Hardware store, the proprietor permits his hobby as a coin collector to crop into his business, giving over part of his show window to a collection of shin plasters and old coins. There is nothing about the collection to indicate their relation to the Hardware articles side by side. The window is quite wide, running across the front of the store, leaving space for a single door. This window had no price cards, and was filled with a multitude of small articles, not one being large enough, or the collection of a class great enough, to catch the eye, with the single exception of the coins.

This window could have been made a success by having a ticket over the coins to catch the eye, such as,

*Any old kind of money goes
a long way at this store.*

Windows of this kind can be made effective for two classes of goods by placing a temporary partition in the

center. If Sporting Goods are handled, this can be made by placing a row of Guns for the dividing line. A very effective way is to hang articles from the ceiling, as Buggy Whips, Fishing Poles, or Baseball Bats.

A Merchant's Idea of Joy.

There are so many articles of this kind handled in all Hardware stores that one is not compelled to use expensive mirrors or grill work. As this dealer advertises in the local paper that his "Treatment is good, service satisfactory, prices enjoyable," one is inclined to enter and test his idea of joy as applied to Hardware prices. The noticeable feature is the lack of store fixtures. The Screws and Tacks are kept in their original boxes, the counter ledges being worn from stepping on them to reach the higher shelves. It was found that the "joyful prices" were so strictly from the dealer's point of view. It is a rule that rarely fails that

Show windows crudely trimmed
Means a storeroom crudely filled.

Correspondence.

Jobbers and Cash Discounts.

To the Editor: Can you explain why jobbers are so forgetful of their promises? They go to the national Hardware conventions and ask for certain privileges, terms, &c., from the manufacturers, and make all kinds of professions that they are anxious to do what is right, and then after they leave the conventions forget all about their promises and ignore them when they get home.

What the writer refers to especially at this time is the question of cash discounts. At the convention at Atlantic City last fall the question came up of the abuse of cash discounts. Now every business man knows that the discount for cash is not a part of the price of the goods, but a bonus for payment to be made within a certain time from the date of the invoice. For example, we give 30 days' time on our invoices, but in some cases give the jobbers the privilege of 2 per cent. cash discount if paid within 10 days from date of invoice, but we find that the jobbers are beginning to forget the promises they made at the convention, that if manufacturers would still continue cash discounts they would not abuse the privilege. We find that some of our customers wait 15 and 20 days, sometimes take the full time of the bill, and then try and sneak in the 2 per cent. off. When we call their attention to it, they sit back and say that "the goods did not arrive in time so that we could check up and see if the bill was right," or "we have a certain day of the month on which we pay for all previous month's shipments." The terms and cash discount are definitely stated on our invoices, and there is no excuse why they should try to take advantage in this way, and it looks to the writer as though there would be some pretty strenuous times at the next convention, when some of the jobbers will find that the privilege of cash discount will not be extended to them on account of the abuses they have made of the privilege in the past.

Manufacturers in 99 cases out of 100 have to pay for their raw materials net cash 30 days, and the only discount they get for prepayment of that time is one-half of 1 per cent. Their labor is all cash, and they have to carry goods in stock manufactured and in the raw condition, and it is a hardship to have their terms of sale abused. We should like to hear from other manufacturers concerning their experience since the last convention.

We make a point of not being captious if a customer is only three or four days over the time, but there is not one of these jobbers but has a large office force, and the discount which they get is more than enough to pay them to have even an extra man to attend to this matter.

We are glad to say that only a few of our jobbing friends seem to take delight in trying to take this advantage; the great majority recognize the justice of the manufacturers' position in regard to the cash discount.

MIDDLE STATES MANUFACTURER.

RUSSELL & ERWIN MFG. COMPANY'S PRICE-LIST.

RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., has issued its price-list No. 6, applying to catalogue Vol. 9, 1899, and supplement of designs. That portion of the book which applies to the catalogue is carefully and conveniently indexed under the following heads: Locks and Lock Sets, Sliding Door Sets, Knobs, Escutcheons, Adjusters, Checks, Sliding Door Handles, Keys, Lifts, Padlocks, Pulleys and Sheaves. In the pages applying to the supplement of designs the numerous patterns mentioned are identified by small accompanying cuts. There is also a complete list of finishes for art Hardware and a description of Locks and Latches applying to the supplement, together with price-lists of Glass Door Knobs, Glass Drawer, Mortise Bolt and Shutter Knobs, Escutcheons for Glass Knobs, Glass Push Plates, Push Buttons, Coat and Hat Hooks, Monogram Knobs and Door Knockers, Russwin Unit Lock Sets and Nails and Studs.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM DOOLEY BROS., who have bought the Hardware business of J. C. Sample, Frankfort, Kan.

FROM MORRISSEY & INEICHEN, Shenandoah, Iowa, who have bought the Hardware, Stove, Sporting Goods and Vehicle business of W. H. Sievers.

FROM G. W. WINGATE, Liberty, Kan., who has succeeded to the Hardware, Stove, Implement and Saddlery business of Wingate and McGugin.

FROM HOOVER BROS., St. Marys, Kan., who have bought the business of Coughlin Hardware Company.

FROM STARR HARDWARE COMPANY, Jackson, Mich., which has increased its capital from \$15,000 to \$25,000.

American Lighting System Generator and Tank

The American Gas Machine Company, Albert Lea, Minn., has put on the market in connection with its lighting system the generator and tank shown in the accompanying illustrations. Fig. 1 represents the generator, the cardinal feature of which is the provision for automatically regulating the flow of gasoline into it from the tank. The generator as now made after 10 years' experience has a thermostatic cut off valve as a check in case the cut off valve is inadvertently opened before the generator is thoroughly heated, which is always liable to happen even though the operator is experienced in operating the machines, as the company says there is no way of determining just how hot the generator should be before it will evaporate the gasoline, and sometimes when in a hurry there is a tendency to turn the supply on too soon. This, the company asserts, cannot happen with the machine here described, as the thermostatic valve, as the name implies, is set so that it positively refuses to open until the generator is hot enough to vaporize the gasoline. To operate the generator all that is required is to fill the generating cup, No. 19, with alcohol—wood or denatured can be used—light it and turn on the cut off valve No. 1, when it can be safely left, as, whenever the generator is hot enough, it will automatically start itself, requiring no further attention beyond lighting the lamp. The various parts of the apparatus are as follows: 1, generator casting; 2, cut off valve; 3, subflame burner; 4, regulator cup; 5, regulating lever; 6, regulating valve; 7, automatic needle guide; 8, subflame valve; 9, regulator float; 10, air inlet gauze; 11, Bunsen tube; 12, mixing

tube; 13, water outlet; 14, top casting; 15, thermostatic valve; 16, thermostatic valve lever; 17, needle post; 18, coil spring, and 19, alcohol cup, the mere enumeration of which in themselves afford a good understanding of the relation each part bears to the other. Fig. 2 is the tank

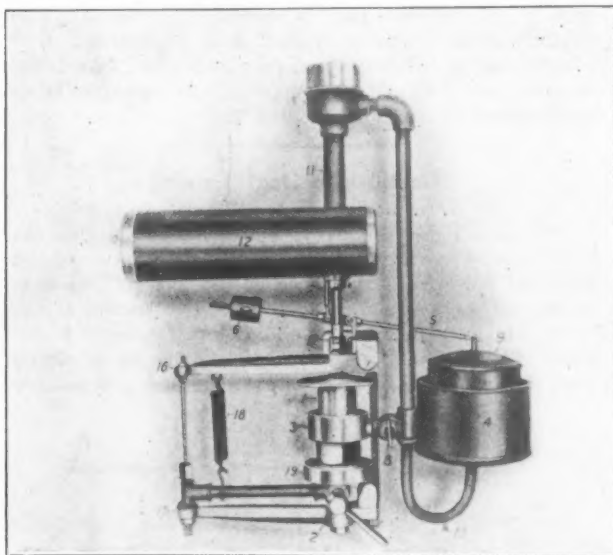


Fig. 1.—Generator for American Lighting System.

furnished to supply the necessary gasoline to the converting system, having a pump with which to introduce sufficient air pressure and a gauge to record the actual pressure in the reservoir. A feature of this part of the outfit is a new safety supply tube, which is double, with double connection at the tank, the inner tube carrying the gasoline fluid, while the outside tube is connected to the top of the tank and carries only air pressure. If from any cause the feed wire should be broken or leak, the gasoline will not enter the building on account of the outer tube connection with the air supply. In the event

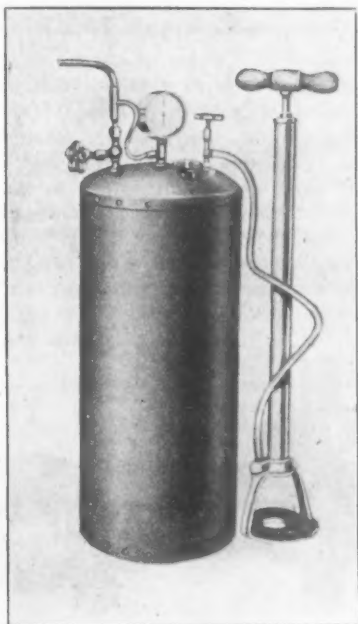
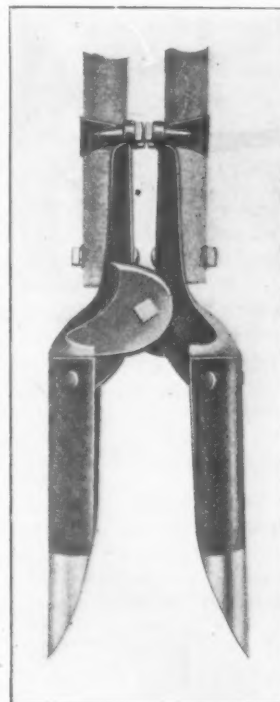


Fig. 2.—Gasoline Tank, Air Pump and Pressure Gauge.

of fracture the supply of air will immediately rush out and naturally the gasoline remains in the tank. Should there be a leak in the gasoline tube, the pressure of the air in the outer tube would simply hold the gasoline back and it would drop to its level in the reservoir. Owing to these conditions, the company points out, it is never necessary to close the cut off valve on the tank as a safety precaution.

Nicholson's E-Z Post Hole Digger.

Nicholson Mfg. Company, Holly, Mich., is manufacturing the post hole digger shown herewith. The blades are made of 40 per cent. carbon steel. They are 6½ in. wide and 9¾ in. long, No. 13 gauge steel. The shanks to which the blades are riveted are of malleable iron and weigh 4 lb. to the pair. The handles are of hard maple and hickory, 15-16 in. in diameter and 4 ft. long. The blades are cut in such a pointed shape at the bottom as to enter the ground easily and to come close together at the lower ends, thus taking up fine soil. A 5-16-in. wrought clip passes around each handle, and each end of the clips passes through clip ties on the top ends of the shanks without boring away any of the timber, adding to the strength of the handles. Each of the malleable shanks has a knuckle joint and an overlapping side brace at the hinge point to form a double barrier against side motion. A ¾ x 2½ in. machine bolt passes through four thicknesses of heavy malleable iron at the hinge point. The two pairs of burrs on the clips on the inside of the handles prevent the handles coming together at the top, thus protecting the operator's knuckles. The shape of the blades at the bottom allows them to come close together, while the handles spread a comparatively short distance apart at the top. The clips around the handles, the double knuckle joint, the burrs on the clips and the comparatively small distance the handles are apart at the top when lifting the dirt from the hole, are alluded to as special features of the digger.



Nicholson's E-Z Post Hole Digger.

Mortar Wheelbarrows.

The wheelbarrows shown in the accompanying illustrations are offered by the Jackson Mfg. Company, Harrisburg, Pa. The barrows are recommended for the use of contractors and paving companies, as well as for general purpose barrows. Owing to the narrow tray and the good capacity they are useful about a place where



Fig. 1.—Steel Frame Utility or Mortar Barrow.

only one barrow is wanted, as they will pass through a narrow doorway, and at the same time the tray is large enough to permit loading 4 cu. ft. of material. The edges of the trays are turned over a 5-16-in. rod, to strengthen them where they are likely to give out the quickest. It is explained that with a forward dump the tray cleans itself. The trays of both wood frame and steel frame barrows are the same size—38 x 28 x 27 in., with a depth

of 15½ x 7½ in. The trays are pressed from 16 gauge steel and the wheels are 16 in. in diameter. The handles of the steel frame barrow are bent at the wheel end to make the tray level when lifted. This barrow weighs



Fig. 2.—Wood Frame Mortar Barrow.

64 lb., and all parts are interchangeable. The wood frame barrow weighs 61 lb.

Curve Cutting Snips.

Bruce & Cook, 186-190 Water street, New York, who wholesale tinnerns' trimmings and materials, are marketing in this country a style of tinnerns' snips, made by a French manufacturer, for cutting difficult and irregular lines and curves in any kind of sheet metals. It will be



Fig. 1.—Circle Cutting Snips and Section through the Blades.

seen by Fig. 1, not only of the snips proper, but of the cross section through the blades, that the blades are ground round, at first resembling somewhat a pair of forceps. The peculiarities of the curves enable the cut portion of the metal to readily pass over the sides, so that there is no piling up or buckling of the

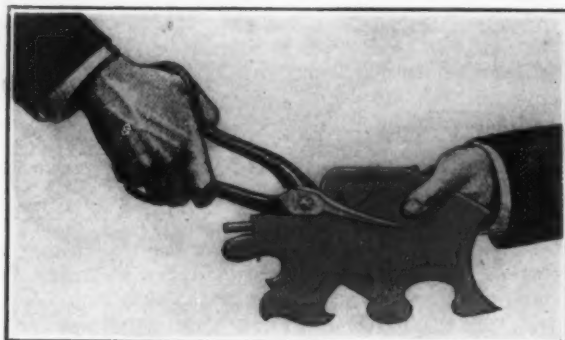


Fig. 2.—The Snips in Use.

material against the edge of the shear in cutting. It is possible to cut irregular figures without removing the tool from the sheet, thus obviating the annoyance often experienced of withdrawing the snips from the work in order to otherwise cut away some portion inaccessible to the snips before continuing the process. The snips have a flat cutting edge which can be easily ground in re-

sharpening when necessary. The peculiar curvature in the grinding of the blades and the range in cutting can be best appreciated by seeing and using the shears. While it is entirely feasible to cut straight edges as well as curves, the snips are designed more particularly for cutting along irregular curved lines, easily and quickly, and with greater freedom than is possible with regular snips having curved or straight blades. Fig. 2 illustrates some possibilities in the cutting of tin plate, sheet iron, brass or other sheet metals, the snips in this instance being in a position to cut along the line A B.

The Square Deal Fence.

Keystone Fence Company, Peoria, Ill., is offering the wire fence shown in the accompanying cuts. One of the principal features of the fence is that the stay consists of one piece of wire running from top to bottom of the fence, which is alluded to as adding much strength to the fence. Another important feature is the wavy strand wire shown in Fig. 1. It is pointed out that this manner

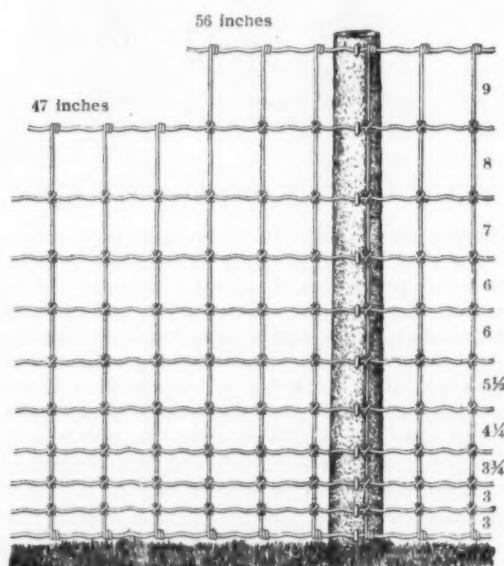


Fig. 1.—The Square Deal Fence.

of construction affords springiness and elasticity, enabling the fence to completely recover from excessive strains which would work permanent injury to the fence. In Fig. 2 is a front view of the lock, showing it as it appears when looking at the fence. Fig. 3 is a sectional view, showing the cross section of the lock; also showing how both the strand and stay wires are bent within the lock and how the lock clinches the two bends in a manner

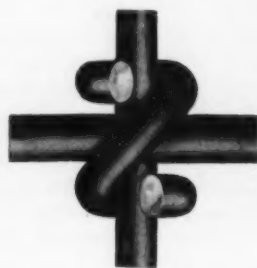


Fig. 2.



Fig. 3.

Square Deal Fence Lock.

to prevent slipping. It is stated that the lock combines great strength and neat appearance with a sufficient amount of flexibility to allow the fence to adjust itself to the lay of the land, and to stretch perfectly over uneven ground. The appearance of the fence is referred to as being neat both in the roll and when stretched, an advantage to the merchant in selling. The fence is made in six heights—20, 26, 32, 39, 47 and 56 in.

A New Railroad Track Jack No. 92.

The Joyce-Cridland Company, Dayton, Ohio, is offering the jack designed specially for railroad use, shown in the accompanying cuts. One man, it is explained, can drop the jack into position anywhere between the ties, and by a few strokes raise the track to any height de-



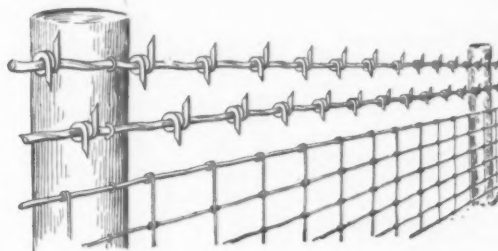
A New Railroad Track Jack No. 92.

sired. The track is moved straight up and down, and is not thrown out of line. The jack can be taken away quickly on the approach of a train. When the lever is raised to lift the track the teeth on the pinion drop into gear with the teeth on the bar, and when the lever is depressed the bar is raised, the teeth in the retaining pawl meanwhile dropping in gear with the teeth on the bar and holding it at the highest point. To make another stroke the operator raises the lever and repeats the operation. When the track is up the jack allows it to be dropped instantly by a touch on the lever. The retaining pawl is held by a short coiled spring, the coil being wound around the pivot of the pawl, and what would ordinarily be the fixed end of the spring is held by a small crank, so that when the crank is turned one way the spring tends to keep the pawl in mesh with the bar, but when

the crank is turned the other way it tends to pull it out. The cut on the left shows the position of the jack, assuming that the track has just been raised. The lever is lifted as if to raise it another notch, and the little side crank, which before has been pointed between the track, is turned away from it. The jack is then in a position to be dropped in an instant whenever desired, and is so left. In using the jack there is no tripping wedge to handle or lose. The cut on the right shows the lever in a vertical position, the pinion having rolled out of gear with the bar, allowing the track to drop.

The Bell Elastic Barb Wire.

The accompanying illustration represents the Bell elastic barb wire, manufactured by the Bell Wire Company, Jackson, Mich. This is a single heavy coiled steel wire, every 6 in. turned completely around a mandrel. The barbs are 4 in. apart, short and sharp, and are warranted not to move. The barbs are rigidly seated on oval flats in the wire, and the flats are condensed in such a manner that the flat, it is remarked, will bear a stronger pull than the plain wire. It is explained that the wire will turn all kinds of stock, however it is set,



The Bell Elastic Barb Wire.

but that it is just as easy and more effective to set the wire so that every barb in the entire line stands straight up and down. With the barbs all standing vertical, it is pointed out that colts and all stock may run and play along the fence in safety, but when they try to reach through the fence the barbs are always in the way. The company states that the wire will not pull in the posts, and that it will not sag or break. The wire is galvanized, not painted, made in two styles, Nos. 1 and 2, alike in all respects except in weight.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	42 @43
City, Boiled.....	43 @44
State and Western, raw.....	40 @41
Raw Calcutta, in bbls.....	47 @48
Lard, Extra Prime, Winter.....	74 @75
Extra No. 1.....	55 @56
No. 1.....	49 @50
Cotton-seed, Crude, f.o.b. mills.....	36 @37
Summer Yellow, Prime.....	48 1/2 @49 1/2
Summer White.....	45 @46
Yellow Winter.....	43 @44
Sperm, Crude.....	59 @60
Natural Winter.....	72 @73
Bleached Winter.....	75 @76
Bleached Winter, Extra.....	76 @77
Tallow, Prime.....	60 @61
Whale, Crude.....	35 @36
Natural Winter.....	46 @47
Bleached Winter.....	48 @49
Extra Bleached Winter.....	50 @51
Menhaden, Brown, Strained.....	32 @33
Light Strained.....	32 @33
Northern.....	31 @32
Southern.....	31 @32
Cocunut, Ceylon.....	10 @11
Cochin.....	10 @11
Cod, Domestic, Prime.....	37 @38
Newfoundland.....	40 @41
Red, Elaine.....	44 @45
Saponified.....	10 1/2 @10 3/4
Olive, Italian, bbls., Yellow.....	87 1/2 @88
Neatsfoot, Prime.....	56 @57
Palm, Logos.....	7 @7 1/4

Mineral Oils—

Black, 29 gravity, 25@30 cold test.....	11 1/4 @12
29 gravity, 13 cold test.....	12 1/2 @13 1/4
Summer.....	11 1/4 @12
Cylinder, light filtered.....	19 @20
Dark, filtered.....	16 1/2 @17 1/2
Paraffine, 903-907 gravity.....	14 @14 1/4
903 gravity.....	13 @13 1/4
883 gravity.....	10 1/4 @11 1/4
Red.....	13 @14 1/4

Miscellaneous—

Barytes:	
White, Foreign.....	10 ton \$18.50@20.50
Amer, floated.....	10 ton 19.00@20.50
Off color.....	10 ton 13.00@16.50
Chalk, in bulk.....	10 ton 3.00@3.25
In bbls.....	100 lb. .35
China Clay, Imported.....	10 ton 11.00@17.50
Cobalt, Oxide.....	100 lb. 2.50@2.80
Whiting, Commercial.....	100 lb. .43@.52
Gilders.....	100 lb. .35@.65
Ex. Gilders.....	100 lb. .60@.65

Putty, Commercial—

In bladders.....	\$1.70 @1.85
In bbls. or tubs.....	1.20 @1.45
In 1 lb to 5 lb cans.....	2.65 @2.95
In 12 1/2 to 50 lb cans.....	1.50 @1.90

Spirits Turpentine—

In Oil bbls.....	67 1/2 @68
In machine bbls.....	68 @69

Glue—

Cabinet.....	12 @15
Common Bone.....	7 1/2 @9
Extra White.....	18 @21
Foot Stock, White.....	12 @14
Foot Stock, Brown.....	9 @11
German Hide.....	12 @18
French.....	10 @12
Low Grade.....	10 @12
Medium White.....	11 @17

Gum Shellac—

Bleached, Commercial.....	46 @48
Bone, Dried.....	57 @59
Button.....	40 @50
Diamond.....	60 @61
Fine Orange.....	52 @57
A. C. Garnet.....	46 @47
Kala Button.....	35 @36
D. O.....	63 @64
Octagon B.....	56 @57
P. N. O.....	48 @49
V. S. O.....	60 @61

Colors in Oil—

Black, Lampblack.....	12 @14
Blue, Chinese.....	36 @48
Blue, Prussian.....	32 @36

Blue, Ultramarine.....	13 @16
Brown, Vandyke.....	11 @14
Green, Chrome.....	12 @16
Green, Paris.....	21 @24
Sienna, Raw.....	12 @15
Sienna, Burnt.....	12 @15
Umber, Raw.....	11 @14
Umber, Burnt.....	11 @14

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9 1/2 @10
Lead, American White:	
Lots of 500 lb or over, in Oil.....	7 1/2 @8
Lots less than 500 lb, in Oil.....	8 @9
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	1/2 @ 1/2
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	1 @ 1
Lead, White, in oil, 1 to 5 lb	
ass'ted tins, add to keg price.....	1 1/4 @1 1/2
Lead, American, Terms: For lots 12	
tons and over 1/4¢ rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	5 1/2 @ 5 1/2
Zinc, American, dry.....	5 1/2 @ 5 1/2
Zinc, French:	
Antwerp, Red Seal, dry.....	8 1/2 @9
Antwerp, Green Seal, dry.....	10 1/2 @11
Paris, Red Seal, dry.....	9 1/2 @10
Paris, Green Seal, dry.....	11 @12
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	13 1/4 @13 1/2
Lots of less than 1 ton.....	13 1/2 @13 3/4
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over.....	11 1/2 @12 1/2
Lots of less than 1 ton.....	12 1/2 @13 1/2
Discounts—French Zinc—Discounts	
to buyers of 10 bbls, lots of one or mixed	
grades, 1%: 25 bbls, 2%; 50 bbls, 4%.	

Dry Colors—

Black, Carbon.....	6 1/2 @10
Black Drop, American.....	3 1/2 @8
Black Drop, English.....	5 @15

Black, Ivory.....	16 @20
Lamp, Com.....	4 @6
Blue, Celestial.....	4 @6
Blue, Chinese.....	31 @33
Blue, Prussian.....	29 @32
Blue, Ultramarine.....	4 1/2 @15
Brown, Spanish.....	1/2 @1
Carmine, No. 40.....	\$3.10 @3.25
Green, Chrome, ordinary.....	3 1/2 @7
Green, Chrome, pure.....	17 @25
Lead, Red, bbls., 1/2 bbls., kegs.....	7 1/2 @7 1/2
Litharge, bbls., 1/2 bbls., kegs.....	7 1/2 @7 1/2
Ocher, American.....	10 ton \$2.50 @16.00
American Golden.....	2 1/2 @3 1/4
French.....	1 1/2 @2
Foreign Golden.....	3 @4
Orange Mineral, English.....	10 @12
French.....	10 1/2 @12
German.....	8 1/2 @10
American.....	8 1/2 @9
Red, Indian, English.....	4 1/2 @6
American.....	3 @3 1/4
Red, Turkey, English.....	4 @10
Red, Tuscan, English.....	7 @10
Red, Venetian, Amer.....	100 lb. \$0.50 @1.25
English.....	100 lb. \$1.15 @1.75
Sienna, Italian, Burnt and	
Powdered.....	3 @6
Italian, Raw, Powdered.....	3 @7
American, Raw.....	1 1/2 @2
American Burnt and Pow'd.....	1 1/2 @2
Talc, French.....	10 ton \$18.00 @25.00
American.....	10 ton 15.00 @25.00
Terra Alba, French.....	100 lb. .30 @1.00
English.....	100 lb. .30 @1.00
American.....	100 lb. .75 @.80
American.....	100 lb. .60 @.65
Umber, T'kev. Bnt. & Pow'd.....	2 @3 1/4
Turkey, Raw and Powdered.....	2 1/2 @3 1/4
Burnt, American.....	1 1/2 @2
Raw, American.....	1 1/2 @2
Yellow Chrome.....	12 @24
Vermilion, American Lead.....	7 @25
Quicksilver, bulk.....	65 @66
Quicksilver, bags.....	66 @67
English, Imported.....	65 @67
Chinese.....	\$0.50 @1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33%
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, etc.

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, $\frac{1}{2}$ doz. pairs, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 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1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 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1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's 50¢10%

Walling's 50¢10%

Cord and Weight—

Ives 33%4%

Faucets—

Cork Lined 50¢10%

Metallic Key, Leather Lined 60¢10%

Red Cedar 40¢10%

Petroleum 70¢10%

L. & L. B. Co. 60¢10%

Star 50¢10%

West Lock 50¢10%

John Sommer's Peerless Tin Key 50¢10%

John Sommer's Boss Tin Key 50¢10%

John Sommer's Victor Mil. Key 50¢10%

John Sommer's Duplex Metal Key 50¢10%

John Sommer's Diamond Lock 50¢10%

John Sommer's L. X. L. Cork Lined 50¢10%

John Sommer's Reliable Cork Lined 50¢10%

John Sommer's Chicago Cork Lined 50¢10%

John Sommer's O. K. Cork Lined 50¢10%

John Sommer's No Brand, Cedar 50¢10%

John Sommer's Perfection, Cedar 50¢10%

McKenna, Brass 50¢10%

Burglar Proof, N. P. 50¢10%

Improved, 1/2 and 3/4 inch 50¢10%

Self Measuring 50¢10%

Enterprise, 1/2 doz. 30¢ 40¢10%

Lane's, 1/2 doz. 30¢ 40¢10%

National Measuring, 1/2 doz. 30¢ 40¢10%

Felloe Plates—

—See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands 70¢10%

Standard Brands 75¢10%

Lower Grade 75¢10%

Imported—

Stubs' Tapers, Stubs' list, July

24, '97 33 1/3-40%

Fixtures, Fire Door—

Richards Mfg. Co.

Universal, No. 103; Special, No. 104

Fusible Links, No. 96 50%

Expansion Bolts, No. 107 50%

Grindstone—

Net Prices:

15 17 19 21

1/2 doz. \$3.25 3.75 4.25 4.75

P. S. & W. Co. 50%

Reading Hardware Co. 50%

Stowell's Giant Grindstone Hanger 50%

Stowell's Grindstone Fixtures, Extra

Heavy, 40¢10%; Light 50%

Fodder Squeezers—

—See Compressors.

Forks—

NOTE.—Manufacturers are

selling from the list of September

1, 1904, but many jobbers are still

using list of August 1, 1899, or

selling at net prices.

Iowa Dig-Easy Potato 60¢10%

Victor, Manure 50¢10%

Victor, Header 50¢10%

Champion, Hay 50¢10%

Champion, Header 50¢10%

Champion, Manure 50¢10%

Columbia, Hay 50¢10%

Columbia, Manure 50¢10%

Columbia, Spading 50¢10%

Hawkeye Wood Barley 50¢10%

W. & C. Potato Digger 50¢10%

Acme Hay 50¢10%

Acme Manure, 4 line 50¢10%

Dakota Header 50¢10%

Jackson Steel Barley 50¢10%

Kansas Header 50¢10%

W. & C. Favorite Wood Barley 50¢10%

Plated.—See Spoons.

Frames— Saw—

White, 8'x12' Bar, per doz. 75¢10%

Red, 8'x12' Bar, per doz. 1.00¢10%

Red, Dbl. Brace, per doz. 1.40¢10%

Freezers, Ice Cream—

Qt. 1 2 3 4 6

Each \$1.30 1.60 1.90 2.20 2.50

Fruit and Jelly Presses—

—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse— Per 1000 Feet.**

Hemp 3.75

Cotton 3.20

Waterproof Sgl. Taped. 3.65

Waterproof Dbl. Taped. 4.40

Waterproof Tpl. Taped. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern 50¢10%

Gauges—

Marking, Mortise, &c. 50¢10%

Marking, Mortise, &c. 50¢10%

Dixon's Marking, Mortise, &c. 50¢10%

Stanley R. & L. Co.'s Butt and

Rabbit Gauge 50%

Marking and Sharpe's 50%

Wire, Morse's 50%

Wire, P. S. & W. Co. 50%

Gimlets— Single Cut—

Numbered assort-

ments, per gro.

Nail, Metal, No. 1, 2.00; 2, 2.30

Spike, Metal, No. 1, 2.00; 2, 2.30

Nail, Wood Handled, No. 1,

2.30; 2, 2.60

Spike, Wood Handled, No. 1,

2.30; 2, 2.60

Glass, American Window

—See Trade Report.

Glasses, Level—

Chapin-Stephens Co. 65¢65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush 25¢10%

International Glue Co. (Martin's) 40%

Grease, Axle—

Common Grade gro. \$1.50@6.00

Dixon's Everlasting, 10-lb pails, ea.

5¢; in boxes, 1/2 doz., 1 lb., 1.20;

1 lb. 2.00

Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. 33%40%

Grindstones—

Pike Mfg. Co.

Improved Family Grindstones, 1/2

inch, 1/2 doz., 2.00 33%4%

Royal Mfg. Co.

Alumund Grinding Machines, each,

Nos. 01, \$1.75; 1A, \$2.50; 10,

\$5.00 30%

Alumund Sickle Grinders, each,

Nos. 20A, \$6.50; 20A Combines, 30%

Alumund Disc Grinders, each,

\$2.50 30%

Grips, Nipple—

Perfect Nipple Grips 40¢10&2%

Halters and Ties—

Cow Ties 60¢50¢10%

Corvet Mfg. Co.

Web 30&2%

Jute Rope 35%

Sisal Rope 20%

Cotton Rope 45%

Hemp Rope 45%

Oneida Community 40&45%

Am. Coil and Halters 45&50%

Am. Cow Ties 45&50%

Niagara Coil and Halters 45&50%

Niagara Cow Ties 45&50%

Hammers—**Handled Hammers—**

Heller's Machinists' 55¢10&55&10&5%

Heller's Farriers' 40¢50&40&10&5%

Magnetic Tack, Nos. 1, 2, 3, 1.25

1.40, 1.75 50%

Peck, Stow & Wilcox, Steel 50%

Payette R. Plumb:

A. E. Nail 40&2%&40&12%&

Eng. and B. S. Hand 50&12%&60%

Machinists' Hammers 50&150&60&5%

Rivet and Tinner's 40&2%&40&12%&

Vaughan & Bushnell Mfg. Co.

A. E. Nail 40&2%&40&12%&

Machinists' 50&150&60&5%

Heavy Hammers and

Sledges

Under 3 lb., per lb., 50¢, 50¢50¢

3 to 5 lb., per lb., 40¢, 80¢50¢

Over 5 lb., per lb., 30¢

Wilkinson's Smiths' lb. 9%10%

Handles—**Agricultural Tool Handles**

Axe, Pick, &c. 60¢10¢60&10&5%

Hoe, Rake, &c. 40¢10&5%

Fork, Shovel, Spade, &c.

Long Handles 40¢45&5%

D Handles 40%

Cross-Cut Saw Handles—

Atkins 40%

Champion 50%

Dixson's 50%

Mechanics' Tool Handles—

Auger, assorted, gro. \$2.50@3.50

Bradawl gro. \$1.65@1.75

Chisel Handles, Ass'd, per gro.:

Tanged Firmer, Apple, \$2.40@

\$2.65; Hickory \$2.15@2.40

Socket Firming, Apple, \$1.75@

\$1.95; Hickory \$1.45@1.60

Socket Framing, Hickory, \$1.60@1.75

File, assorted, gro. \$1.30@1.40

Hammer, Hatchet, &c. 60¢10¢60&10&5%

Hand Saw, Varished, doz.

80¢5¢; Not Varished, 65¢75¢

Plane Handles:

Jack, doz. 30¢; Jack, Bolted, 75¢

Fore, doz. 45¢; Fore, Bolted, 90¢

Chapin-Stephens Co.

Carving Tool 40¢40&10%

Chisel 65¢65&10%

File and Awl 65¢65&10%

Saw and Plane 40¢40&10%

Screw Driver 40¢40&10%

Millers Falls Adj. and Hatchet Auger

Handles 50&10%

Nicholson Simplicity File Handle

W. A. Zehner Supply Co.

Hammer, per doz., 12 in., \$2.00;

14 in., \$2.30; 16 in., \$2.80; 18 in.,

\$2.50; 20 in., \$2.70; 22 in., \$3.00;

24 in., \$3.30; 26 in., \$3.50; 30 in.,

\$3.80.

Sledge, per doz., oval 30 in., \$3.80;

octagon, 30 in., \$3.80; oval 36 in.,

\$4.00; octagon, 36 in., \$4.00.

Axe, per doz., 28 to 34 in., \$5.60;

36 in., \$5.80.

Adze, per doz., 36 in., \$5.80; 36 in.,

\$7.80.

Pick, per doz., R. R., 36 in., \$8.00;

coal, 34 in., \$5.80.

Hatchet, per doz., 12 to 14 in., \$2.00.

Hangers—

NOTE.—Barn Door Hangers are gen-

erally quoted per pair, without track,

and Parlor Door Hangers per double set

with track, &c.

Allith Mfg. Co.

Reliable, No. 1; Allith, No. 3; A-1

11th Adjustable, No. 6; Reliable

Parlor Door 50%

Chicago Spring Butt Co.:

Oscillating 25%

Big Twin 25%

Chisholm & Moore Mfg. Co. 50%

Baggage Car Door 50%

Elevator 50%

Railroad 50%

Cronk & Carrier Mfg. Co. 60&10%

Loose Axle 60&10%

Roller Bearing 70%

Griffin Mfg. Co.

Solid Axle, No. 10, \$12.00 70%

Roller Bearing, No. 11, \$15.00, 70%

Roller Bearing, Ex. Hy. No. 2,

\$18.00 70%

Hinged Hangers, \$18.00 60&10%

Lane Bros. Co.

Parlor, Ball Bearing, \$1.00;

Standard, \$3.15; No. 105, \$2.85;

New Model, \$2.80; New Cham-

pion \$2.25

Barn Door, Standard, 60&5%

Hinged net \$6.08

Covered 60&2%

Special 70&5%

Lawrence Bros. 60&2%&

Advance and Sterling 70&7%&

Cleveland and Peerless 70&7%&

Clipper, No. 75 60&5%

Crown 60&2%

Cyclone-Tandem net \$7.50

Easy Parlor Door, Dbl. Sets,

\$2.50; Single Sets, \$1.25 60%

Giant 70&7%&

Hummer 70&7%&

New Cyclone, Flexible, \$16.00@

New York 60&2%&

McKinney Mfg. Co.

No. 2, Special, \$15 60&10%

No. 2, Standard, \$18 60&10%

Hinged Hangers, \$16 50%

Meyers' Stayon Hangers 60&5%

Hitchers, Stall—

Corert Mfg. Co., Stall Hitchers. 30&2%

Hods—Coal—

M'l'r's list, price per gross.

Inch	15	16	17	18
Galv. Open	\$35	\$39	\$42	\$46
Galv. Open	26	28	31	35
Galv. Funnel	45	48	52	56
Galv. Funnel	33	36	39	43

Masons' Etc.—Cleveland Wire Spring Co.:
Steel Brick, No. 162, each \$1.05
Steel Mortar, No. 158, each \$1.35**Hoes—Eye—**

Scovill and Oval Pattern.

Grub, list Feb. 23, 1899.

D. & H. Scovill.

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobs are still using list of August 1, 1900, or selling at net prices.

Cronk's Weeding, No. 1, \$2.75; No. 2, \$2.50

Star Double Bit, \$3.20

Ft. Madison Cotton Hoe, \$7.00&10.00

Ft. Madison Crescent Cultivator Hoe, \$7.00&10.00

Ft. Madison Mattock Hoe, \$7.00&10.00

Regular Weight, \$7.00&10.00

Junior Size, \$7.00&10.00

Ft. Madison Sprouting Hoe, \$7.00&10.00

Ft. Madison Dixie Tobacco Hoe, \$7.00&10.00

Kretzinger's Cut Easy, \$7.00&10.00

Warren Hoe, \$7.00&10.00

W. & C. Ivanhoe, \$7.00&10.00

R. B. 6 in. Cultivator Hoe, \$7.00&10.00

R. B. 6 in. id., \$7.00&10.00

Acme Wedging, \$7.00&10.00

W. & C. Lining Shovel Hoe, \$7.00&10.00

Hoisting Apparatus—

See Machines, Hoisting.

Holders—Bit—

Angular, \$7.00&10.00

Door—

Bardsley's, Iron, 10%; Brass and Bronze, 33%

Empire, 50%

Pullman, 35%

Superior, 33%

File and Tool—

Nicholson File Holders and File Handles, 33&40%

Fruit Jar—

Triumph Fruit Jar Holder, \$7.00&10.00

Trace and Rein—

Fernald Double Trace Holder, \$7.00&10.00

Dash Rein Holder, \$7.00&10.00

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swat, 50%

Hooks—Cast Iron—

Bird Cage, Reading, 40%

Clothes Line, Reading List, 40%

Clothes Line, Stowell, 70%

Coat and Hat, Reading, 45&20%

Coat and Hat, Stowell, 70%

Coat and Hat, Wrightsville, 60%

Harness, Reading List, 40%

Harness, Stowell, 70%

School House, Stowell, 70%

Wire—

Belt, 80%

Wire C. & H. Hooks, 75&75&10%

Columbian Hdw. Co., Gem, 70&5%

Parker Wire Goods Co., King, 70&10%

Western W. G. Co. Molding, 70%

Wire Goods Co., Chief, 70%; Crown, 75%; Car, 65%; V. Brace, 75%; Car Harness, 50&10%

Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$1.50.

Cotton, \$7.00&10.00, \$1.05&\$1.25

Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—

Hooks, Bench, see Staps, Bench.

Bush, Light, doz. \$4.75; Medium, \$5.35; Heavy, \$6.25

Grass, best, all sizes, per doz. \$1.60

Grass, common grades, all sizes, per doz. \$1.30

Whiffletree, lb. 5&6

Hooks and Eyes: Brass, 60&5&60&10&45%

Malleable Iron, 70&70&40%

Corset Mfg. Co. Gate and Scuttle Hooks, 40%

Ft. Madison Cut-Easy Corn Hooks, \$7.00&10.00

Turner & Stanton Co. Cup and Shoulder, 80&10&10%

Bench Hooks—See Bench Staps.

Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horse.

Hose, Rubber—

Garden Hose, 1/2-inch: Competition, ft. 5 @ 6

3-ply Guaranteed, ft. 8 @ 9

4-ply Guaranteed, ft. 10 @ 11

Cotton Garden, 1/2-in., coupled: Low Grade, ft. 8 @ 9

Fair Quality, ft. 10 @ 11

Irons—Sad—

From 4 to 10, lb. 3 @ 3 1/2

B. B. Sad Irons, lb. 3 1/2 @ 3 1/2

Mrs. Potts, cents per set:

Nos. 50 53 60 65

Jap'd Tops, 80 77 90 80

Tin'd Tops, 85 88 95 80

New England Pressing, lb. 3 1/2 @ 4

Pinking—

Pinking Irons, dos. 600

Irons, Soldering—

See Copiers.

Jacks, Wagon—

Covert Mfg. Co.:

Auto Screw, 30&2%; Steel, 45%

Lockport, 50%

Lane's Steel, 30&10&2%

Richards' Tiger Steel, No. 130, 50&10%

Smith & Hemenway Co.'s, 25%

Kettles—

Brass, Spun, Plain, 20&25%

Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher, &c., 30%

Wilkinson Shear & Cutlery Co., 60%

Corn—

Wilkinson Shear & Cutlery Co.,

Without Brand Knives and Hooks, 60%

Wilmington Acme, \$7.00&10.00

Dent, \$2.75; Adj. Serrated, \$2.20

Serrated, \$2.10; Yankee No. 1, \$1.50

Yankee No. 2, \$1.15

Drawing—

Standard List, 75&5&75&10%

C. E. Jennings & Co. Nos. 45, 46, 60

Jennings & Griffin, Nos. 41, 42, 75%

Swan's, 50%

Watrous, 15%

L. & J. J. White, 20&5&25%

Hay and Straw—

Serrated Edge, per doz. \$5.50&5.75

Iwan's Sickle Edge, \$7.00&7.50

Iwan's Serrated, \$7.00&7.50

Mincing—

Buffalo, \$7.00&13.00

Miscellaneous—

Farriers', \$7.00&13.25

Wostenholm's, \$7.00&13.25

Knobs—

Base, 2 1/2-inch, Birch, or Maple,

Rubber Tip, \$7.00&11.40

Carriage, Jap., all sizes, 40&45%

Door, Mineral, \$7.00&10.00

Door, Por. Jap'd, \$7.00&10.00

Door, Por. Nickel, \$7.00&10.00

Bardsley's Wood Door, Shutters, &c., 15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Allith Mfg. Co., Reliable, 50%

Lane's Store, 25%

Myers' Storeless Store Ladders, 50%

Richards Mfg. Co.,

Improved Storeless, No. 112, 50%

Climax Shelf, No. 113, 50%

Trolley, No. 109, 50%

Ladies, Molting—

L. & G. Mfg. Co. (low list), 25%

P. S. & W., 40&10%

Reading, 60%

Lanterns—Tubular—

Regular Tubular, No. 0, \$7.00&14.50

Lift Tubular, No. 0, \$7.00&14.50

Hinge Tubular, No. 0, \$7.00&14.50

Other Styles, \$7.00&14.50

Bull's Eye Police—

No. 1, 2 1/2-inch, \$2.75&3.00

No. 2, 3-inch, \$3.00&3.25

Leads and Stands, Shoe—

Stowell's Atlas, Malleable Iron, 50%

Stowell's Badger, Cast Iron, 50%

Latches—Thumb—

Roggin's Latches, with screw, \$7.00&14.00

Door—

Allith Mfg. Co., Automatic, No. 400, \$7.00&14.00

Cronk & Carrier Mfg. Co., No. 101, \$7.00&14.00

Cronk & Carrier Mfg. Co., Latch, \$7.00&14.00

Haap and Staples, 50%

Richards' Bull Dog, Heavy, No. 1, \$7.00&14.00

Richards' Trump, No. 127, \$7.00&14.00

Stowell's Steel, 50%

Leaders, Cattle—

Small, \$7.00&14.00; large, 60&70

Covert Mfg. Co.:

Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%

Lifters, Transom—

R. & E., 10%

Lines—

Wire Clothes, Nos. 18 19 20

100 feet, \$2.25 2.50 1.75

75 feet, \$1.75 1.95 1.10

Anniston Waterproof Clothes, 50 ft., \$7.00&14.00

\$7.00&14.00; Gilt Edge, \$23.00; Air Line, \$23.00; Acme, \$18.00; Alabama, \$17.00; Empire, \$16.00; Advance, \$14.00; Eclipse, \$13.50; Chicago, \$12.50; Standard, \$10.50; Columbia, \$9.50; Allston, \$13.50; Calhoun, \$12.00

Samson Cordage Works:

Solid Braided Chalk, Nos. 9 to 3, 40%

Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50

Masons' Lines, Shade Cord, &c., \$7.00&14.00

White Cotton, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75; Linen, No. 3 1/2, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50

Tent and Awning Lines, No. 5, \$7.00&14.00

White Cotton, \$7.50; Drab Cotton, \$8.50

Clothes Lines, White Cotton, 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$5.25

Turner & Stanton Co.:

Solid Braided Chalk, Masons' and Awning Lines, 40%

Clothes Lines, White Cotton, 30%

Shade Cord, Cotton or Linen, 20%

Locks—Cabinet—

Cabinet Locks, 35 1/2%

Door Locks, Latches, &c.—

NOTE.—Set Prices are very often made on these goods.

Reading Hardware Co., 40%

R. & E. Mfg. Co., 10%

Elevator—

Stowell's, 50%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass, 75&10%

Sash, &c.—

Ives' Patent:

Bronze and Brass, 60%; Crescent, 20%; Iron, 80%; Window Ventilating, 55%; Robinson Pat. Ventilating Sash Lock, 33%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%

Pullman Patent Ventilating Lock, 35%

Reading, 40%

Machines—Boring—

Com. Up'r't, without Augers, \$2.00&2.25

Com. Ang'l'r, without Augers, \$2.25&2.50

Swan's Improved, 40&10%

Jennings' Nos. 1 and 4, 50%

Miller's Pulley, 50%

Snell's, Upright, \$2.65; Angular, \$2.90

Corking—

Reinsinger Invaluable Hand Power, \$7.00&14.00

Fence—

Williams' Fence Machines, each, \$5.50

Moore's Anti-Friction Chain Hoist, 30%

Moore's Hand Hoist, with Lock, 20%

Moore's Cyclone High Speed Chain Hoist, 25%

Ice Cutting—

Chandler's Washing, 12 1/2%

Boas Washing Machine Co.:

Boss No. 1, \$57.00

Boss Rotary, \$57.00

Champion Rotary Banner No. 1, \$57.00

Standard Champion No. 1, \$50.00

Standard Perfection, \$27.00

Cincinnati Square Western, \$33.00

Uneda American, Round, \$33.00

Mallets—

Hickory, \$5.65&5.50

Lignumvite, \$5.65&5.50

Tinnars' Hickory and Applewood, \$5.65&5.50

Mangers, Stable—

Sweet Iron Works, 50%

Mashers, Vegetable—

Western, W. G. Co. Potato, 60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list, 50%

Keystone Wire Matting Co.:

Keystone, 50%

Ideal, 50%

Mattocks—

See Picks and Mattocks.

Milk Cans—See Cans, Milk.**Mills, Coffee, &c.—**

Enterprise Mfg. Co., 20&25%

National list Jan. 1, 1902, 30%

Parker's Columbia

Picks and Mattocks—
List, Feb. 23, 1899. 70¢ @ 70¢ 10%
Cronk's Handled Garden Mattock,
doz., No. 2, \$2.60; No. 3, \$6.40.

Pinking Irons—
See Irons, Pinking.

Pincers—

Vaughan & Bushnell Mfg. Co.:
Blacksmith's, per doz., 10 in.,
\$5.00; 12 in., \$5.50; 14 in., \$6.00.
Carpenter's Claw, per doz., 6 in.,
\$2.00; 8 in., \$2.75; 10 in., \$3.50.

Pins, Escutcheon—

Brass, per doz., 50 @ 50¢ 10%
Iron, list Nov. 11, '85. 60¢ @ 60¢ 10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in. 50¢ @ 50¢ 10%
Extra Heavy, 2-6 in. 65¢ @ 65¢ 10%
Fittings, 70¢ @ 70¢ 10% 10% 5%

Pipe, Merchant—

Consumers, Carloads.
Steel. Iron.
Blk. Galv. Blk. Galv.

1/4 & 1/2 in.	3	47	7	4
3/4 in.	65	51	59	41
1 in.	67	65	61	49
1 1/4 in.	71	61	66	56
2 to 12 in.	66	51	61	46

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 3
to 24 in., f.o.b. factory:

First-class 84%
Second-class 87%
NOTE—Market irregular.

Pipe, Stove—

Per 100 joints.
C. L. C. L.

5 in., Standard Blue	\$6.25	\$7.25
6 in., Standard Blue	7.75	7.75
7 in., Standard Blue	7.75	8.75
8 in., Royal Blue	7.00	8.00
9 in., Royal Blue	7.50	8.50
10 in., Royal Blue	8.50	9.50
Wheeler Corrugating Co.'s Nested:		
5 in., Uniform Color	\$6.15	\$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual. 30¢ @ 30¢ 10%
Bench, second qual. 40¢ @ 40¢ 10%
Molding 25¢ @ 25¢ 10%
Bailey's (Stanley R. & L. Co.) 35¢ 2%

Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes

Bailey's (Stanley R. & L. Co.) 35%
Chapin's Iron Planes 40%
Miscellaneous Planes (Stanley R. & L. Co.) 30% 5%
Union 60%

Plane Irons—

Wood Bench Plane Irons, list
Dec. 12, '06. 25%
Buck Bros. 30%
Chapin-Stephens Co. 35%
Stanley R. & L. Co. 35%
Union 50%
L. & J. White 20% 50¢ 25%

Planters, Corn, Hand—

Kohler's Eclipse 40¢ doz. \$8.00

Plates—

Fellow 10¢ @ 4¢ 10%
Self-Sealing Pie Plates (R. M. Co.) per doz. \$2.00 50%

Pliers and Nippers—

Button Pliers 75¢ @ 75¢ 10%
Gas Burner, per doz., 5 in., \$1.25
@ \$1.30; 6 in., \$1.45 @ \$1.50.
Gas Pipe, 7 10 12-in.
\$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers—

Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button 75¢ 10%
Cronk's 50%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 35%
Heller's Farmers' Nippers, Pincers
and Tools 40% 50¢ 10% 5%
The Nettleton Mfg. Co. Reversible
Cutting Nippers 40%
P. S. & W. Timmers' Cutting Nip-
pers 40%
Wm. Schollhorn Co.:
Bernard, 33% 1/2; Elm City, 33% 1/2;
Paragon, 50%; Lodi, 50%.

Pruning Hooks and Shears

See Shears.

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, per doz., \$12.00.
\$9.00; Small, \$7.50.
Giant, No. 1, per doz., \$18; No. 1 1/4,
\$16.50; No. 3, \$15. 33% 1/2
Staple Pullers, Utica and Davi-
son 60%
Parrot Tack and Stub Puller, per doz.,
75¢; per gro., \$6.00

Pulleys, Single Wheel—

Inch 1 1/4 1 1/2 2 3
doz. \$0.30 .35 .60 1.05
Avening or Tackle.
Hay Fork, Squirrel or Solid Eye,
doz., 4 in., \$1.25; 5 in., \$1.55

Hot House, doz.

Inch 1 1/4 1 1/2 2 3
Hot House, doz. \$0.65 .85 1.20
Screw, doz. \$0.16 .19 .23 .30
Inch 1 1/4 1 1/2 2 3
Side, doz. \$0.25 .30 .35 .60
Inch 1 1/4 1 1/2 2 3

Stowell's

Cutting or End, Anti-Friction 60% 10%
Dumb Waiter, Anti-Friction 60% 10%
Electric Light 60%
Side, Anti-Friction 60% 10%

Sash Pulleys—

Common Frame; Square or
Round End, per doz, 1 1/4 and
2 in. 10¢ @ 10¢ 10%
Auger Mortise, no Face Plate,
per doz. 7¢ and 8 in. 7¢ @ 7¢ 10%
Acme, No. 35, 1 1/4 in., 18¢ 1/2; 2 in., 20¢ 1/2

Points, Glaziers—

Bulk and 1-lb. papers 10¢ 10¢
1 1/2-lb. papers 10¢ 10¢ 10%
1/4-lb. papers 10¢ 10¢ 10%

Pokes, Animal—

Ft. Madison Hawkeye 40¢ doz. \$3.25
Ft. Madison Western 40¢ doz. \$4.00

Police Goods—

Manufacturers' Lists 25¢ @ 25¢ 5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb. can (powder),
each, \$1.25; per doz., \$12.00; No. 2, 10 lb.
can (cake), each, \$2.50; per doz., \$24.00.
Prestoline Liquid, No. 1 (1/2 pt.),
doz., \$3.00; No. 2 (1 qu.), \$9.00. 40%
Prestoline Paste 40%
George William Hoffman:

U. S. Metal Polish Paste, 3 oz.
boxes, per doz. 50¢; 5 oz. doz. \$4.50;
1 lb boxes, per doz. \$1.25; 1 lb
boxes, per doz. \$2.25.
U. S. Liquid, 8 oz. cans, per doz.,
\$1.25.
Barnes' Friend Metal Polish, per
doz., \$1.75.

Stove—

Black Eagle Benzine Paste, 5 lb cans,
per doz. \$1.00
Black Eagle, Liquid, 1/2 pt. cans,
per doz. \$1.00
Black Jack Paste, 1/2 lb cans, per gr. \$9.00
Black Kid Paste, 5 lb cans, each, \$0.65
Ladd's Black Beauty Liquid, per
100 tins \$2.75
Joseph Dixon's, per gr. \$5.75 10%
Dixon's Plumbago, per lb 6¢
Fireside per gr. \$2.50
Gem, per gr. \$1.50 10%
Japanese per gr. \$3.50
Jet Black per gr. \$3.50
Peerless Iron Enamel, 10 oz. cans,
per doz. \$1.50

Wynn's Black Silk:

Paste, cans, per doz., 5 oz., \$0.75;
1 lb., \$1.00; 1 lb., \$1.75
Paste, 5 lb can \$0.70
Liquid, cans, per doz., 6 oz., \$0.75;
1/2 pt., \$1.00; 1 pt., \$1.75
Steel Range Enamel, per doz., 1/2 pt.,
\$1.00; 1/2 pt., \$1.25.

Poppers, Corn—

1 qt. Square, doz. \$0.80; gro. \$8.00
1 qt. Round, doz. \$0.90; gro. \$9.00
1 1/2 qt. Square, doz. \$1.00; gro. \$10.00
2 qt. Square, doz. \$1.20; gro. \$12.00

Post Hole and Tree Au-

gers and Diggers—
See also Diggers, Post Hole, etc.
Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢;
5 ft., 46¢; 6 ft., 48¢.
Steel Hitching Posts each \$1.30

Potato Parers—

See Parers, Potato.
Pots, Glue—
Enamelled 35¢ 10%
Tinned 30¢ 10%

Powder—

In Containers:
Duck, 1 lb. each 45¢
Fine Sporting, 1 lb. each 75¢
Rifle, 1/2 lb. each 15¢
Rifle, 1 lb. each 25¢

In Keys:

12 1/2-lb. kegs \$3.50
25-lb. kegs \$4.50
King's Semi-Smokeless:
Keg (25 lb bulk) \$6.50
Half Keg (12 1/2 lb bulk) \$3.50
Quarter Keg (6 1/4 lb bulk) \$1.90
Case 24 (1 lb cans bulk) \$8.50
Half case (1 lb cans bulk) \$4.50
King's Smokeless: Shot Gun, Rifle,
Keg (25 lb bulk) \$12.00 \$15.00
Half Keg (12 1/2 lb bulk) 6.25 7.75
Quarter Keg (6 1/4 lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk) 14.00 17.00
Half case 12 (1 lb c. bk.) 7.00 8.75
Robin Hood Smokeless Shot Gun, 50¢ 20%

Presses—

Fruit and Jelly
Enterprise Mfg. Co. 20¢ 25%
Seal Presses—
Morrill's No. 1, per doz., \$20.00 50%

Pruning Hooks and Shears

See Shears.

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, per doz., \$12.00.
\$9.00; Small, \$7.50.
Giant, No. 1, per doz., \$18; No. 1 1/4,
\$16.50; No. 3, \$15. 33% 1/2
Staple Pullers, Utica and Davi-
son 60%
Parrot Tack and Stub Puller, per doz.,
75¢; per gro., \$6.00

Pulleys, Single Wheel—

Inch 1 1/4 1 1/2 2 3
doz. \$0.30 .35 .60 1.05
Avening or Tackle.
Hay Fork, Squirrel or Solid Eye,
doz., 4 in., \$1.25; 5 in., \$1.55

Hot House, doz.

Inch 1 1/4 1 1/2 2 3
Hot House, doz. \$0.65 .85 1.20
Screw, doz. \$0.16 .19 .23 .30
Inch 1 1/4 1 1/2 2 3
Side, doz. \$0.25 .30 .35 .60
Inch 1 1/4 1 1/2 2 3

Stowell's

Cutting or End, Anti-Friction 60% 10%
Dumb Waiter, Anti-Friction 60% 10%
Electric Light 60%
Side, Anti-Friction 60% 10%

Sash Pulleys—

Common Frame; Square or
Round End, per doz, 1 1/4 and
2 in. 10¢ @ 10¢ 10%
Auger Mortise, no Face Plate,
per doz. 7¢ and 8 in. 7¢ @ 7¢ 10%
Acme, No. 35, 1 1/4 in., 18¢ 1/2; 2 in., 20¢ 1/2

Points, Glaziers—

Bulk and 1-lb. papers 10¢ 10¢
1 1/2-lb. papers 10¢ 10¢ 10%
1/4-lb. papers 10¢ 10¢ 10%

Box-All-Steel, Nos. 3 and 7, 2 in.

Grand Rapids All Steel Noiseless 50%
Ideal 70¢ 5%
Niagara, No. 25, 1 1/4 in., 18¢ 1/2; 2
in. 20¢ 1/2
No. 26, Troy, 1 1/4 in., 14¢ 1/2; 2 in., 16¢ 1/2
Star, No. 26, 1 1/4 in., 18¢ 1/2; 2 in., 20¢ 1/2
Tangle Blocks—See Blocks.

Pumps—

Cistern 60%
Pitcher Spout 75¢ 10%
Wood Pumps, Tubing, etc. 45¢ 50%
Barnes Del. Acting (low list) 40% 10%
Barnes Pitcher Spout 75¢ 10%
Contractors' Rubber Diaphragm No.
2, B. & L. Block Co. \$16.00
Daisy Spray Pump per doz. \$6.50
Flint & Walling's, Fast Mail Hand,
(low list) 50%
Flint & Walling's, Fast Mail (low
list) 50%
Flint & Walling's Tight Top Pitcher,
75¢ 10%

National Specialty Mfg. Co. Measur-
ing, No. 2, \$6.00; 3, \$5.50 30%
Myers' Pumps (low list) 40% 10%
Myers' Power Pumps 40% 10%
Myers' Spray Pumps 40% 10%

Pump Leathers—
Plunger and Lower Valve—Per
gro.:
Inch 2 2 1/2 2 3/4 2 3/8
Inch \$2.20 2.50 2.75 3.00
Inch 3 3 1/4 3 1/2 3 3/4 4
Inch \$3.30 3.60 3.85 4.10 4.40

Plunger Cup Leathers—Per 100:
Inch 2 1/2 3 3 1/4 4
Inch \$2.75 3.85 5.00 6.00

Punches—

Saddlers' or Drive, good doz. 50¢ 75¢
Spring, single tube, good qual-
ity \$1.75 @ 2.00
Revolving (1/2 tubes) doz. \$3.50 @ 3.75

Bemis & Call Co.'s Cast Stl Drive 50%
McMillan's Nos. 1A, 1A, 1B, 1C
\$15.00 50%
Hercules, 1 die, each \$5.00 50%
Niagara Hollow Punches 40%
Niagara Solid Punches 55¢ 10%
Wm. Schollhorn Co.:
Belt and Tacket, Bernard, 33% 1/2;
Paragon, 50%; Lodi, 50%
Timmers' Hollow, P. S. & W. Co. 33% 1/2
Timmers' Solid, P. S. & W. Co. 33% 1/2
doz., \$1.44 50%

Rail—Barn Door, etc.—
Sliding Door, Painted Iron 2 1/2 @ 2 3/4
Sliding Door, Wrought Brass,
1 1/4 in., lb. 36¢ 30%
Allith Mfg. Co.: Reliable Hanger
Track 50%
Cronk's:
Braced Steel Rail, per ft. 3 1/4¢
O. N. T. Rail 3¢
Hinge Rail, per 100 ft. 33¢ 1/2
Griffin's:
xxx, per 100 ft., 1 x 3-16 in., \$3.00;
1 x 3-16 in., 3.50;
Hinged Hanger, per 100 ft., 1 x 3-16
in., \$3.10; 1 1/4 x 3-16 in., \$3.80.
Lane's:
Hinged Track, per 100 ft., 1 in., \$3.40;
1 1/4 in., \$3.90;
O. N. T. per 100 ft., 1 in., \$3.00; 1 1/4
in., \$3.60; 1 1/2 in., \$4.00.
Standard, 1 1/4 in. per 100 ft. \$4.00
Lawrence Bros.:
per 100 ft., No. 201, \$4.00; No. 202, \$4.00
New York, 1 x 3-16 in., per 100 ft. \$3.00
Hinged Hanger Rail, per ft., 11¢ 50%
None Better per ft. 3 1/4¢
Standard per ft. 4¢
Myers' Stave Track 60¢ 10%
Richards' Mfg. Co.:
3-16, \$3.25; 1 1/4 x 3-16, \$3.50;
3-16, \$3.25; 1 1/4 x 3-16, \$3.50.
Special Hinged Hanger Rail 60¢ 10%
Lag Screw Rail, No. 65 50%
Gauge Trolley Track, per ft., No. 31,
9¢; No. 32, 14¢; No. 33, 20¢
No. 50, \$1.00; 52, \$2.25; 53, \$3.50; 54,
\$4.00; 45, \$3.25; 46, \$3.50; 49, No. 1,
\$3.25; 49, No. 2, \$3.50.
Stowell's:
Cast Rail per ft. 2 1/4¢
Steel Rail, Plain 25%
Wrought Bracket, 1 1/4 x 3-16 in., per ft. 3¢
Wrought Bracket, 1 1/4 x 5-16 in., per ft. 7¢
Sweet's Hylor, per ft. 11¢ 50%
P. L. B. Steel Rail per 100 ft. \$3.00
No. 0, 1 x 3-16 in. per 100 ft. \$3.00

Rakes—
NOTE—Many goods are sold
at net prices.
Fort Madison Red Head Lawn \$3.25
Fort Madison Blue Head Lawn \$2.70
Jackson Lawn, 29 and 30 teeth,
doz., net \$1.25
Cronk's:
New Champion Garden, per doz., 12
teeth, \$15.00; 14, \$16.50; 16, \$18.00. 10%
Victor Garden, per doz., 12 teeth,
\$15.00; 14, \$16.50; 16, \$18.00. 10%
Queen City Lawn, per doz., 20 teeth,
\$2.85; 24, \$3.00. net
Anticlog Lawn, per doz. \$4.00
Malleable Garden, 70¢ 10%
Ideal Steel Garden, per doz., 12 teeth,
\$15.00; 14, \$16.50; 16, \$18.00. 10%
Kohler's:
Lawn Queen, 20-teeth per doz. \$2.90
Lawn Queen, 24-teeth per doz. \$3.00
Paragon, 20-teeth per doz. \$2.70
Paragon, 24-teeth per doz. \$2.75
Steel Garden, 14-teeth per doz. \$2.40
Malleable Garden, 14-teeth, per doz. \$1.75 @ 2.00

Rasps, Horse—
Dieston's 75%
Heller Bros. 70¢ 50¢ 70¢ 10% 5%
Liveright Bros. Gold Medal 70¢ 10% 75%
McCaffrey's American Standard, 60¢ 10% 5%
New Nicholson 70¢ 10% 75%
See also Files.

Razors

Lina Ras-ir 50%
Fox Razors, per doz., No. 42, \$6.00; No. 44, \$20.00; No. 82, Platina. } doz. \$25.00

Red Devil 50%

Silberstein:
Carbo Magnetic, \$21.00; Griffon No.
65, \$13.50; Griffon, No. 60, \$12.00;
all other Razors, 40%.

Safety Razors—

Kampfe Bros.:
Star Safety, 25%; Star Interchange-
able, 25%; Star Safety Corn, 25%.
Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9 1/4, M 16,
Q 16, A 16, B 16, 408, Rubber,
Populo, Nickered Populo 20%
Aluminum, German Milt., Bronze 25%
1240 N, 124 N, 124 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P, 33 1/4; 2904 PN, 33 1/4; 2924 N,
33 1/4; 0284 N, 33 1/4; 0284 PN, 33 1/4;
33 1/4; 802 N, 33 1/4;
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P,
202 PN, 102 P, 202 PN 50%
304 P, 304 PN, 00304 P, 00304 PN, 33 1/2

Registers—List July 1, 1903.
Japanned, Electroplated and
Bronzed 60% 10%
White Porcelain Enamel 60%
Solid Brass or Bronze Metal, 40¢ 10%

Revolvers—

Single Action 95¢ @ \$1.00
Double Action, except 4 1/4 cal. \$1.80
Double Action, 4 1/4 caliber \$2.00
Automatic \$3.50
Hammerless \$4.00

Riddles, Hardware Grade
16 in. per doz. \$2.50 @ \$2.75
17 in. per doz. \$2.75 @ \$3.00
18 in. per doz. \$3.00 @ \$3.25

Rings and Ringers—

Bull Rings—
Steel \$0.70 1/2 5 inch.
Copper \$1.15 1.35 1.75 doz.
Iron's Improved Self Piercing, per doz.,
Copper 2 in., \$1.25; 2 1/2 in., \$1.50;
3 in., \$1.75.

Hog Rings and Ringers—
Hill's Rings, gro. boxes, \$4.00 @ \$4.50
Hill's Ringers, Gray Iron doz. 50¢ 55¢
Hill's Ringers, Malleable Iron doz. 70¢ 75¢

Blair's Rings per doz. \$4.75 @ \$5.25
Blair's Ringers, per doz. \$0.60 @ .65
Brown's Rings, per doz. \$5.00 @ \$5.50
Brown's Ringers, per doz. \$0.60 @ .65

Rivets and Burrs—

Queer Creek Shps.....	40¢
Sand Stone.....	6¢

Scythe Stones—			
Chicago Wheel & Mfg. Co.	35¢	35¢	35¢
Gem, 10 gro., 10 in., 12 in., 10.80.			
Norton Alundum Scythe Stones:			
Less than 10 gross lots...	10 gro.	\$6.00	
Lots of 10 gross or more...	10 gro.	\$4.50	
Pike Mfg. Co., 1901 list:			
Black Diamond S. S.	10 gro.	\$12.00	
Lamolle S. S.	10 gro.	\$11.00	
White Mountain S. S.	10 gro.	\$9.00	
Green Mountain S. S.	10 gro.	\$8.00	
Extra Indian Pond S. S.	10 gro.	\$7.50	
No. 1 Indian Pond S. S.	10 gro.	\$7.00	
No. 2 Indian Pond S. S.	10 gro.	\$6.50	
Leader Red End S. S.	10 gro.	\$6.00	
Quick Cut Emery...	10 gro.	\$10.00	
Pure Corundum...	10 gro.	\$18.00	
Crescent...	10 gro.	\$7.00	
Emery Scythe Rifles, 2 Coat, 48			
Emery Scythe Rifles, 3 Coat, 10			
Emery Scythe Rifles, 4 Coat, 11			
Balance of 1901 list 33%			
Stoppers, Bottle—			
Victor Bottle Stoppers...	10 gro.	\$9.00	
Stops—Bench—			
Millers Falls...	15	10%	
Morrill's, No. 1, 10 in.	50		
Morrill's, No. 2, 12 in.	50		
Door—			
Chapin-Stephens Co.	60	60	10%
Plane—			
Chapin-Stephens Co.	20		
Straps—Box—			
Cary's Universal, case lots...	20	10	10%
Stretchers, Carpet—			
Cast Iron, Steel Points, dos.	60	60	10%
Socket—			
Boiler, 10 doz.	10	\$1.00	
Excelsior Stretcher and Tack Hammer Combined, 10 doz.	10	\$6.00	
Woven Fence—			
Franklin...	ca.	\$3.75	
Strops, Razor—			
Star Diagonal Strop...	25		
Stuffers, Sausage—			
Enterprise Mfg. Co.	25	25	10%
National Specialty Co., list Jan. 1, 1902	30	45	10%
Sweepers, Carpet—			
National Sweeper Co.	10	doz.	
Louis XV, Roller Bearing, Gold Plated	10	\$12.00	
Hepplewhite, Roller Bearing, Silver Plated	10	\$12.00	
Sheraton, Roller Bearing, Nickel	10	\$12.00	
Ye Mission, Roller Bearing, Oxidized Coppered	10	\$12.00	
Transparent, Roller Bearing, Plate Glass top, Nickel	10	\$12.00	
National Queen, Roller Bearing, Fancy Veneers	10	\$12.00	
Loyal, Roller Bearing, Veneers	10	\$12.00	
Triple Model, Roller Bearing, Nickel	10	\$12.00	
Marion, Roller Bearing, Nickel	10	\$12.00	
Marion Queen, Roller Bearing, Nickel	10	\$12.00	
Monarch, Roller Bearing, Nickel	10	\$12.00	
Monarch, Roller Bearing, Jap.	10	\$12.00	
Perpetual, Regular B's, Jap.	10	\$12.00	
Monarch Extra (17 in. case), Roller Bearing, Nickel	10	\$12.00	
Monarch Extra (17 in. case), Roller Bearing, Japanned	10	\$12.00	
Auditorium (26 in. case), Roller Bearing, Nickel	10	\$12.00	
Mammouth (30 in. case), Roller Bearing, Nickel	10	\$12.00	
NOTE—Rebates: 50¢ per dozen on three-dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$3.50 per dozen on twenty-five-dozen lots.			
Eureka Japanned...			
Model A, Sanitaire...	10	\$15.00	
Model A, Sterling...	10	\$25.00	
Model B, Sterling, Nickel	10	\$23.00	
Model B, Sterling, Japanned	10	\$23.00	
Model C, Sterling...	10	\$21.50	
Model D, Sterling...	10	\$19.50	
Tacks, Finishing Nails, &c.			
New List, May 1, 1905.			
American Carpet Tacks...	90	30	%
American Cut Tacks...	90	30	%
Necesses Cut Tacks...	90	30	%
Necesses Upholsters...	90	30	%
Gimp Tacks...	90	30	%
Lamp Tacks...	90	30	%
Trimmers' Tacks...	90	30	%
Looking Glass Tacks...	65		
Hill Posters' and Railroad Tacks...	90	30	%
Hungarian Nails...	80	20	%
Finishing Nails...	70		
Trunk and Clout Nails...	80		
NOTE—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10% is given on light weights.			
Miscellaneous—			
Double Pointed Tacks...	90	40	5 tens
See also Nails, Wire.			
Tanks, Oil and Gasoline—			
Each			
E. M. Co., Oil			
Gal. Emerald	30	\$3.50	
30	30	\$3.50	
60	30	\$3.50	
Wilson & Friend Co., Oil			
Gal. Gasoline	30	\$3.50	
30	30	\$3.50	
60	30	\$3.50	
1.0	30	\$3.50	
Tapes, Measuring—			
American Asses' Skin	50	10	%
Patent Leather	25	30	45
Steel	35	1	35
Chesterman's	25	25	45
Kentel & Esser Co.	40	10	30
Favorite, Ass Skin	40	10	30
Favorite, Duck and Leather	35	35	10%

Metallic and Steel, lower list, 35¢			
35¢; Pocket, 35¢			
Lutrin's—			
Asses' Skin	10	10	50%
Metallic	30	30	45
Patent Bend, Leather	25	45	25
Pocket	40	40	45
Steel	35	35	45
Wiebusch & Hilger:			
Chesterman's Metallic, No. 34L			
etc.	25		
Chesterman's Steel, No. 1038L			
etc.	35		
Teeth, Harrow—			
Steel Harrow Teeth, plain or headed, 1/2-inch and larger, per 100 lbs.	2.75	to	\$3.00
Thermometers—			
Tin Case...	80	10	80
Ties, Bale—Steel Wire—			
Single Loop...	80	10	85
Monitor, Cross Head, etc.	70	2	1/2
Brick Ties—			
Niagara Brick Ties	25	10	%
Tinner's Shears, &c.—			
See Shears, Tinner's, etc.			
Tinware—			
Stamped, Japanned and Piced, sold very generally at net prices.			
Tire Benders, Upsetters, &c.			
See Benders and Upsetters, Tire.			
Tools—Coopers—			
L. & I. J. White	20	20	45
Hay—			
Myers' Hay Tools	50		
Stowell's Hay Carriers, 50%			
Forks, 50%			
Miniature—			
Smith & Hemenway Co.'s, Davidson	25		
Saw—			
Atkins' Cross Cut Saw Tools	35	45	%
Simonds' Improved	35	45	%
Simonds' Crescent	35	45	%
Ship—			
L. & I. J. White	35		
Transom Lifters—			
See Lifters, Transom.			
Traps—Fly—			
Balloon, Globe or Acme, doz.	1.15	to	\$1.25
Harper, Champion or Paragon, doz.	1.25	to	\$1.50
Game—			
Imitation Oneida	70	10	%
newhouse	10	10	50
Hawley & Norton	10	10	50
Victor Community Jump	50		
Oneida	50		
Mouse and Rat—			
Mouse, Wood, Choker, doz. holes	12		
Mouse, Round or Square Wire, doz.	85	90	%
Marty French Rat and Mouse Traps (Genuine):			
No. 1, Rat, 10 doz., case of 24	31	25	
No. 3, Rat, 10 doz., case of 50	30	25	
No. 3 1/2, Rat, 10 doz., case of 72	30	25	
No. 4, Mouse, 10 doz., case of 150	30	25	
No. 5, Mouse, 10 doz., case of 180	30	25	
Trimmers, Spoke—			
Wood's E 1	50		
Trowels—			
Diston Brick and Pointing	25		
Diston Plastering	20		
Diston "Standard Brand" and Garden Trowels	30		
Kohler's Steel Garden Trowels, 10 gro., 5 in., 4.80; 6 in., 6.00.			
Never-Break Steel Garden Trowels.			
Rose Brick and Plastering	25	25	%
Woodrough & McParlin, Plastering	25		
Trucks, Warehouse, &c.—			
B. & L. Block Co.			
New York Pattern	50	10	%
Western Pattern	60	10	%
Handy Trucks	10	10	%
Grocery	10	10	%
Daisy Stove Trucks, Improved Pattern	10	10	%
McKinney Trucks, each 10.00			
Model Store Trucks	10	10	%
Tubs, Wash—			
M'Yr's list, price per gross.			
No. 1, 2, 3			
Galvanized, 10 1/2 76 83 96 104 5			
Galvanized Wash Tubs (B. M. Co.), No. 1, 2, 3, 10, 20, 30			
Per doz., net \$3.70 6.30 7.30 6.00 7.20 8.10			
Twine, Miscellaneous—			
Plaz Twine:			
No. 9, 1/4 and 1/2-lb. Balls	23	25	%
No. 12, 1/4 and 1/2-lb. Balls	21	22	%
No. 18, 1/4 and 1/2-lb. Balls	18	20	%
No. 24, 1/4 and 1/2-lb. Balls	17	19	%
No. 36, 1/4 and 1/2-lb. Balls	16	18	%
Chalk Line, Cotton	14		
Balls	26	31	%
Cotton Mops, 6, 9, 12 and 15 lb. to doz.	11	19	%
Cotton Wrapping, 5 Balls to lb., according to quality	15	19	35
American 2-Ply Hemp, 1/4 and 1/2-lb. Balls	14	15	4
American 3-Ply Hemp, 1-lb. Balls	15	16	4
India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine)	10	11	4
India 3-Ply Hemp, 1-lb. Balls	10	11	4
India 5-Ply Hemp, 1 1/2-lb. Balls	10	11	4
2, 3, 4 and 5-Ply Jute, 1-lb. Balls	13	14	4
Mason Line, Linen, 1/2-lb. Balls	14	17	%
No. 25 1/2 Mattress, 1/4 and 1/2-lb. Balls, according to quality	30	60	%
Wool, 3 to 6 ply... B 9¢; A 10¢			

Vises—

Solid Box.....50 @ 50¢/10%

Parallel—

Atchall Machine Co.

Simpson's Adjustable.....40%

Standard.....40%

Amateur.....25%

Columbian Hdw. Co.....40%

Emmett Universal.....20%

Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.

Machinist and Tool Makers' No. 4A, \$12.50; No. 6A, \$10.00; No. 10A, \$22.50.

Presto Quick Acting Adjustable Jaw, 25¢/25¢/10%; Solid Jaw.....35¢/35¢/10%

Tiger Machinists'.....40%

Fisher & Norris Double Screw, net, each, Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00.

Fulton Mach. & Vise Co.,

Reed, Swivel.....25%

Star, Solid Jaw.....40%

Hollands:

Machinists'.....40¢/45¢/50%

Lewis Tool Co.,

Adjustable Jaw.....30%

Monarch, 50%; Solid Jaw.....50%

Massey Vise Co.:

Clincher.....40%

Perfect, 15%; Lightning Grip.....15%

Merrill's.....20%

Millers Falls Oval Slide Pattern.....60¢/10%

Parker's:

Victor, 20¢/25%; Regulars.....20¢/25%

Vulcaus.....40¢/45%

Combination Pipe.....55¢/60%

Prentiss.....20¢/25%

Snediker.....33%

Stephens'.....33%

Saw Filers—

Diston's D 3 Clamp and Guide, 30 doz., \$24.00, 30%; Clamps.....40%

Perfection Saw Clamps, 30 doz., \$4.50

Reading.....60%

Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....2%

Wood Workers—

Fulton Mach. & Vise Co.:

Reed.....25%

Star.....40%

Massey Vise Co.:

Lighting Grip, 15%; Perfect.....15%

Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.

Miscellaneous—

Holland's Combination Pipe.....60¢/60¢/45%

Massey's Quick Action Pipe.....40%

Parker's Combination Pipe.....40%

87 Series, 60%; 187 Series, 60.5%; No. 870, 40%.

Wads—Price per M.

B. E., 11 up.....60¢

B. E., 9 and 10.....70¢

B. E., 8.....80¢

B. E., 7.....80¢

P. E., 11 up.....\$1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger \$1.70/1.75

Ely's P. E., 12 to 20.....\$3.00/3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:

Enameled.....45¢/10%

Ground.....50¢/45%

Plain or Unground.....60%

Country Hollow Ware, per 100 lbs.....\$3.00

White Enameled Ware:

Maslin Kettles.....65¢/10%

Covered Wares:

Tinned and Turned.....35¢/10%

Enameled.....45¢/10%

See also Pots, Glue.

Enameled—

Agate Nickel Steel Ware.....60%

Iron and Steel Ware.....70¢/45%

Lava, Enameled.....40¢/10%

Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....6 7 8 9

Each.....45¢ 50¢ 55¢ 60¢

Steel Hollow Ware—

Avery Spiders and Griddles.....65¢/65¢/45%

Avery Kettles.....60%

Porcelain.....50¢/50¢/10%

Never Break Spiders and Griddles.....65%

Never Break Kettles.....60%

Solid Steel Spiders and Griddles.....65¢/45%

Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone.....40¢/40¢/10%

Washboards—

Solid Zinc:

Crescent, family size, bent frame,\$3.70

Double Star, family size, stationary protector.....\$3.70

Low Zinc Surface:

Saginaw Globe, family size, stationary protector.....\$3.25

Cable Cross, family size, stationary protector.....\$3.40

Single Zinc Surface:

Naiad, family size, open back, perforated.....\$2.90

Single Saginaw Globe.....\$2.75

Brass Surface:

Flask King, Single Surface, open back.....\$3.65

Nickel Plate Surface:

No. 1001 Nickel Plate, Single Surface.....\$3.65

Glass Surface:

Flask King, Single Surface, open back.....\$3.65

Enamel Surface:

Enamel King, Single Surface, ventilated back.....\$3.65

Washers—Leather, Axle—

Solid.....80¢/10¢/80¢/10¢/10%

Patent.....90¢/90¢/45%

Coll.: 1

